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BEng Manufacturing Systems Engineering

2018

Improving Safe Access to Specht CNC Machines to Optimise Production and Maintenance at Bridgend Engine Plant

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Declaration of Authenticity

This thesis is the result of the authors' original research. It has been composed by the author and has not been previously submitted for examination which has led to the award of a degree.

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0.0 Abstract

This project looks at the impact of lost production due to gantry stoppages on the AJ133/126 block machining line within Ford Motor Company Bridgend Engine plant. Various problems during production affect output of blocks per shift, averaging 19.5 JPH (jobs per hour i.e. number of blocks machined per hour) with a target of 24 JPH to meet the demand from Jaguar-Land Rover of 145,000 units per annum (Appendix 1). This deficit in production is potentially costing the company around £11,000,000 per year in reduced throughput (Appendix 2). This project looks at root issues causing this deficit in production and implements a solution that will help to narrow it.

Production data was collected over a three month period. This data was interrogated to realise the common causes of gantry down-time, scaffolding erection/removal.

Scaffolding is currently erected when certain corrective maintenance activities need to be carried out; this costs the company around £3,000 a month in scaffolding costs (Appendix 3). Another project is currently being carried out to reduce the numbers of breakdowns with the introduction of a preventative maintenance team. This should lead to a reduction in the number of breakdowns that require the scaffolding but the preventative maintenance team will need scaffolding access to carry out some of the preventative tasks.

The most cost effective method to overcome this problem was to erect permanent guarding on top of the machine that could be accessed using a communal platform. Various types of guarding construction were considered for cost and safety prior to the final design. Kits were made up for each of the types of CNC machines that needed access (Specht 500W & 500D). In order to implement this new guarding, several methods of installation were considered but most proved to be impractical. Installation was scheduled during planned down time and occasionally during breakdown maintenance operations when spare people were available to install.

Documentation is to be produced not only to verify the safety of this new equipment, in the form of risk assessments, but to ensure good working practices during installation and subsequent use of the new guarding. Maintenance on the guarding is scheduled in the form checks every three months via a ford production system tool, SMS (scheduled maintenance sheets).

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1.0 Introduction

1.1 History

Ford Motor Company is a multinational corporation founded in 1903 by Henry Ford. With Headquarters based in Dearborn, Michigan, USA, Ford employs around 201,000 people in six continents (Ford Motor Comapany, 2017) and has the title of the forth largest car manufacturer in the world (MBASkool, 2017).

Ford began operations in Britain in 1909 and currently operates three major manufacturing sites in the UK; Bridgend Engine plant, Dagenham Engine Plant and Halewood, as well as Dunton Technical Centre which is concerned with research and development.

Bridgend Engine Plant was built in 1978 and produced its first engine in 1979. Currently there are two main production lines; The Sigma line which produces 1.25 - 1.6 litre Sigma and GTDi engines used in a number of Ford cars including the Fiesta and Mondeo, with smaller numbers being bought for specialist purposes such as Yamaha boats. The AJ133 line produces 3.0L V6s, 3.0L V6 turbos and 5.0L V8 engines for Jaguar Land Rover. The two production lines are fed from a number of smaller machining lines within the plant, one such line which feeds the AJ production line is the PAG block machining line. It is this line that will be the focus of this project.

1.2 Problem

The area that this report looks at focuses on PAG Block Machining. This line machines three main variants of engine Blocks, The V6 3.0L, V6 3.0L turbo and the V8 5.0L (figure 1).
PAG block machining has historically had a hard time keeping up with demand even though

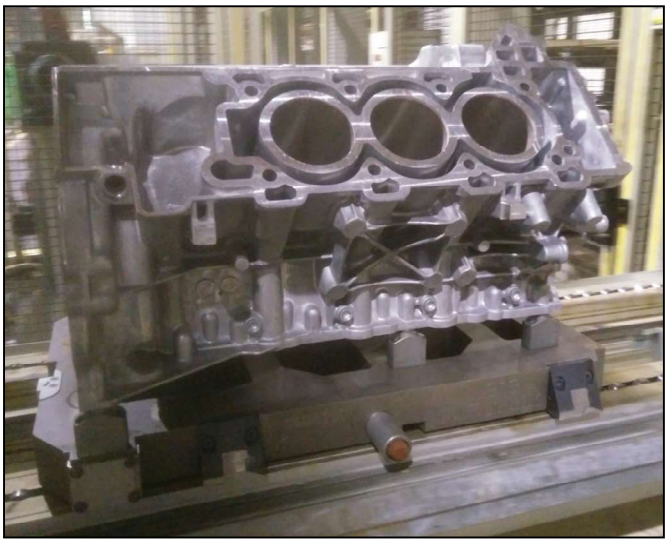


Figure 1: Picture of a V6 block between machining cells

theoretically it has excess capacity; 100% JPH is 35, target is 24 JPH but current production averages 19.5 JPH (Appendix 1). It is plagued by a number of known and unknown factors that consistently limit production. There are currently a number of both standard (for obvious problems) and Six Sigma projects being carried out within PAG block machining which management hopes will act as a pincer movement to help address the low production rates. It is through this pincer initiative that this low JPH has come to the author's attention. She has been told to investigate the sources of this downtime and look to reduce it in order to increase overall production.
This machining line is cell based in design; gantry cranes feed parts in and out of individual machines within a cell. One of the main advantages of cell based production is that if one machine in a cell is shutdown for maintenance, the other machines can continue to run. This method allows for a reduced drop in production in comparison to transfer lines if there is a failure. However, this advantage does not pass on to the gantries or washes. If either must be shutdown for any reason, production will become blocked on all previous machines and starved further down the line. For this reason, gantry and wash time is critical and any time lost at these points can quickly have a knock on effect on production.

2.0 Aim and Objectives

2.1 Aim

Investigate, quantify and diminish the problem of reduced production due to downtime of gantries.

2.2 Objectives

- Gather data using tools such as POSMON to quantify the current cost to the company due to gantry shutdown time.
- Identify the main causes of shutdown time.
- Brainstorm ideas that would stop/help to reduce this.
- Implement a solution and quantify estimated cost savings.

3.0 Literature review

3.1 Total Quality Management

Total Quality Management (TQM) is a forerunner to popular quality improvement systems such as Lean and Six Sigma. TQM is a management based approach to quality focusing on customer requirements while keeping costs to a minimum. There are four main parts to TQM; quality planning, quality assurance, quality control and quality improvement (Hakes, 1991). Progress comes from analysis and improvement in work process following the Plan, Do Check, Act cycle (Deming, 1950). Unfortunately, one of the main disadvantages is that it is very difficult to fully implement. It requires large upfront costs and although, with the correct implementation, it will make money in the long run, many companies are unwilling to make that initial leap (BusinessKnowledgeSource, 2010). The system itself focuses on customer needs so much that it can often ignore large problems such as the hidden factory, wastes and other non-process based issues. TQM projects do not have specific bottom line metrics that enable teams to understand and visualise the benefits, because of this historically TQM projects were easily shelved when times got tough. As previously mentioned TQM is being superseded by Lean and Six Sigma, these newer methods take the best tools, such as continual improvement, plan-do-check-act and company-wide alignment.

3.2 Lean Manufacturing

The objective of lean manufacturing is to get more for less. This can be done by following a number of principles. Most sources agree that value streaming, variation reduction and increased flow are the main doctrines of lean (Ruffa, (2008), Wilson, (2009), Earley, (2016)). Ruffa, (2008) talks about lean manufacturing as a tool to enable companies to prepare for unexpected changes. He says that instead of floundering and prehaps going under, a lean buisness should be prepared for sudden changes and adapt to new operational requirements. Lean looks at processes and strives to remove waste therfore increasing flow. A system with no waste is faster and by definition quicker to adapt and cheaper as less money is wasted in problem areas such as high inventory and over processing. With proper implimentation of lean dynamics a business undergoes a transformational change, systems flow better and work arounds are eleminated.

3.3 Six Sigma

The main aim for Six Sigma is to create an organisation with as close to error free processes as possible. The name Six Sigma alludes to this aim. Sigma itself is a term that is used to define the variability of a process. There are levels of sigma that are used to quantify a processes level of performance; these levels are obtained by corresponding numbers of standard deviations around a process data set. The more standard deviations that can fit between acceptable upper and lower process limits, the narrower the bell curve and the less likely that a defect will occur in said process, hence Six Sigma performs better than 1-5 sigma [Figure 2]. (SixSigma Institute, 2018)

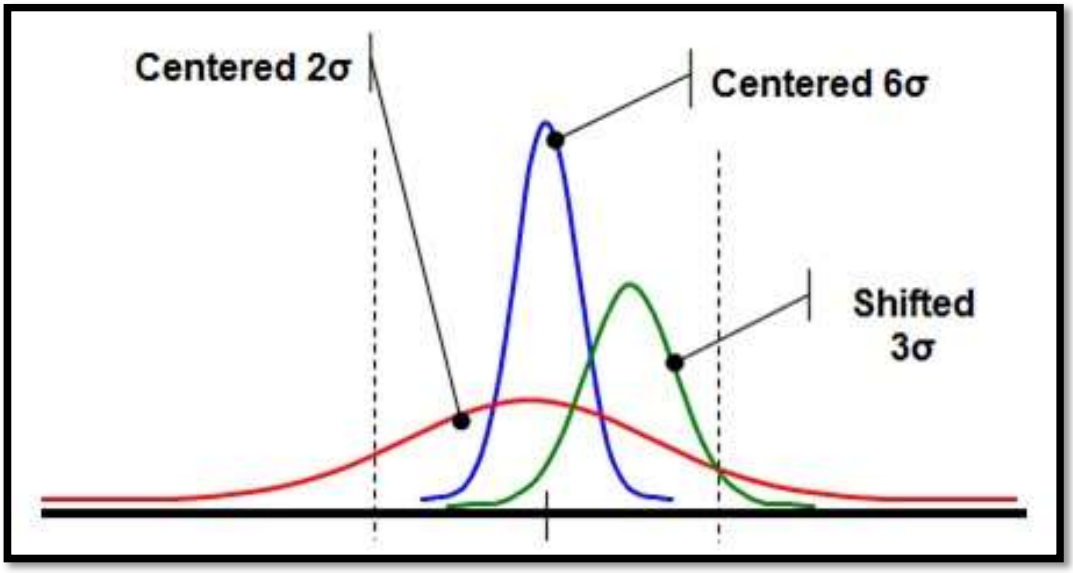


Figure 2: Bell curves of various sigma's shown around the mean process value. Dotted lines indicate upper and lower process limits. (SixSigma Institute, 2018)

The amount of parts outside these upper and lower acceptable limits (defects) are measured in defects per million opportunities (DPMO). The various sigma levels represent a specific number of defects per million opportunities; these are shown in Figure 3. Here you can see that for obvious reasons working towards and obtaining Six Sigma within an organisation would be hugely advantageous.

Sigma	Spelling	Money	Time	DPMO
3 σ	1.5 misspelled words per page in a book	$ 2.7 Million Indebtedness per $1 Billion in Assets	3 ½ Months per century	66,807
4 σ	1 misspelled word per 30 pages in a book	$63,000 Indebtedness per $1 Billion in Assets	2 ½ Days per century	6,210
5 σ	1 misspelled word in a set of encyclopedias	$ 570 Indebtedness per $1 Billion in Assets	30 Minutes Per Century	233
6 σ	1 misspelled word in all the books in a small library	$ 2 Indebtedness per $1 Billion in Assets	6 Seconds Per Century	3.4

Figure 3: Table showing DPMO per sigma level as well as simple examples to show real world implications (SixSigma Institute, 2018).

In order to achieve this goal, Six Sigma provides a tool base to help deal with process improvements. These tools are to be used within the Define-Measure-Analyse-Improve-Control (DMAIC) methodology. This method has the advantage of being flexible enough to apply to any business process within any organisation. This is an advancement upon previous methods that have traditionally focused only upon manufacturing processes (Pyzdek & Keller, 2015).

Bennion, et al., (2016) and Vijay, (2014) used DMAIC to help enhance flow in healthcare applications to enable patients to be seen in better timeframes. This increasing of flow is similar to the aim of this project and it is of manufacturing origin, the area for with DMAIC was produced. Ng, et al., (2014), Tong, et al., (2014) and Sahay, et al., (2011) have, as well as many others, successfully used DMAIC to solve manufacturing problems. For this project Six Sigma offers an advantageous view and structure on problem solving. It embodies a number of useful traits from TQM but streamlines them and enables the user to follow the set steps of DMAIC. DMAIC has the advantage of keeping a user on track and focused on the problem at hand. There are a number of Lean tools that are commonly used within the DMAIC structure, sometimes referred to under the umbrella of Lean Six Sigma, such as Value Stream Mapping, 5 Whys, Poke-Yoke etc. This project will make use of Lean tools where applicable as they are readily compatible with the DMAIC structure.

3.4 DMAIC

The DMAIC methodology is a Six Sigma tool that is used to problem solve and improve processes within a company. DMAIC is an acronym that stands for:

Define: Define the project goals, customers, scope and variables.

Measure: Measure the process to quantify the problem. Identify Inputs and Outputs.

Analyse: Analyse the data, identify root causes.

Improve: Develop and implement systems that eliminate the root causes.

Control: Monitor the process to prevent reoccurrence of the problem. (Sivakumar, 2017)

Each stage has a set structure and list of tools; this enables DMAIC to be a powerful instrument when dealing with process issues as it forces the team to base improvements on solid data. It is worth noting that not all elements of each stage must be used, it is up to the team to decide which ones would be most relevant to the problem that is being examined. (Jirasukprasert, et al., 2014)

3.4.1 Define

The define phase focuses only on the problem. Causes and solutions can be dealt with later on. This phase is about understanding the problem and the scope of the project [Figure 4]. It is very important that the problem is fully defined as without a good definition a project will have issues later on.

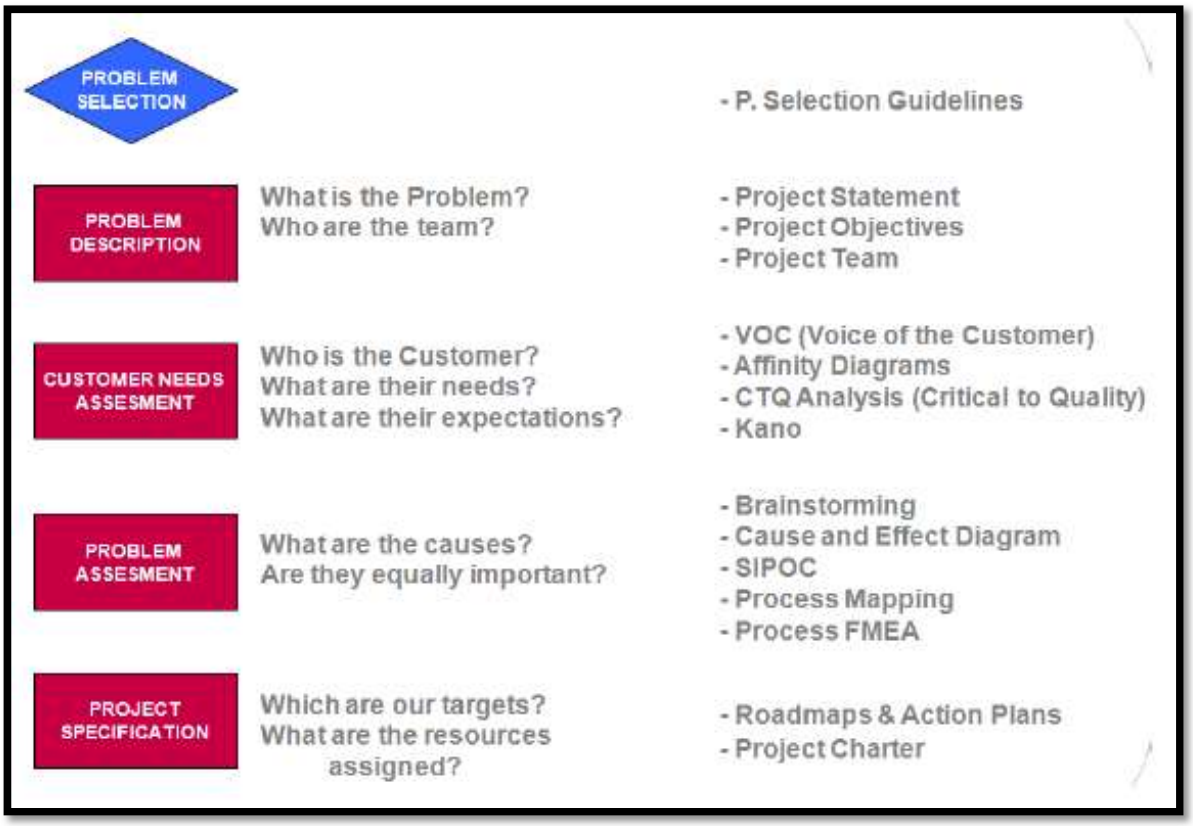


Figure 4: The Define phase (Espelosin, 2011)

3.4.2 Measure

In the measure phase we look at the data. Data must be gathered on the process that is under scrutiny, this data can come from existing measurements or new ones can be developed in order to quantify the problem. Here an accurate picture must be created that shows the historical performance of the process.

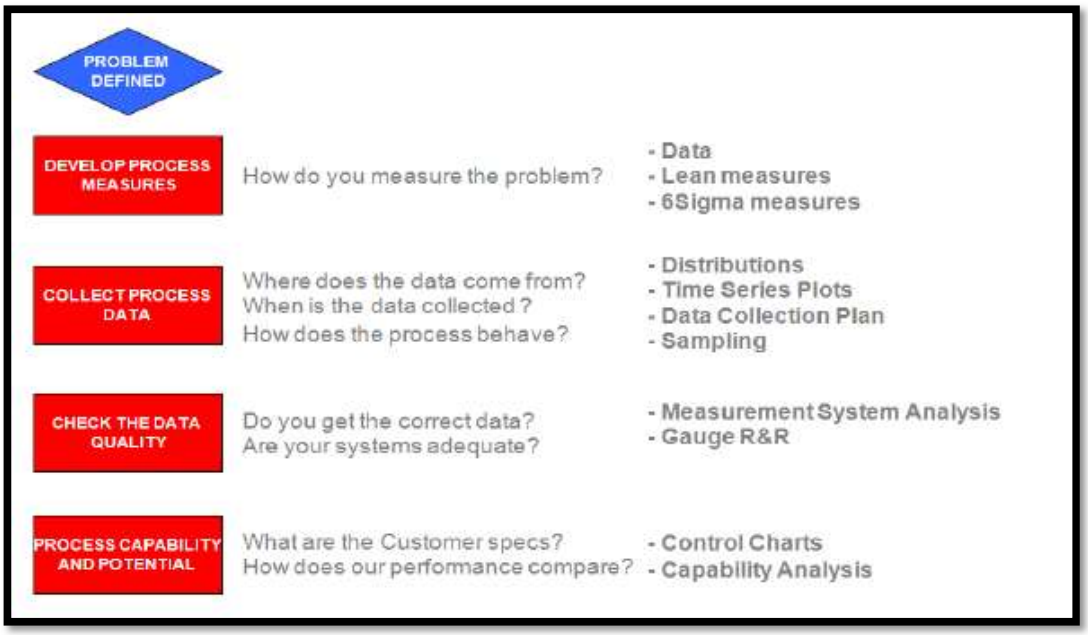


Figure 5: The Measure phase (Espelosin, 2011)

The information gathered during the course of this report will be obtained from a Ford system known as POSMON. This system is implemented plant wide. All production machines have bits within the PLC programs dedicated to POSMON. The PLC relays information about its status to the Ford network. This information is collated and can be accessed from any computer in the factory connected to the network. There are hundreds of ways to present the data, anywhere from one machine on a specific day to the whole factory for a month. The system was designed by the in-plant IT team and has numerous built in equations to enable various common metrics to be taken from the data, for example 'first time though', 'mean time to repair', 'overall equipment effectiveness' etc. This gives Ford workers an amazing tool to enable them to gain historic and real time data on any machine without having to actually go onto the shop floor and devise a way of collecting the data.

The main problem with this is that so much data is available it is easy for workers to get bogged down with information. A study carried out on information overload found that 62% of managers feel that decisions are delayed or the ability to make decisions is adversely affected by to much information and that one third of managers suffer from ill health from stress associated with too much information (Waddington, 1996). Pyzdek & Keller, (2015)talk about how a large majoraty of companys collate so much information that the really useful metrics get lost in a sea of data. The key to a good Six Sigma project, they say, lies in extracting a small amount of more telling metrics. This makes it much easier for a team to focus and understand issues without getting lost or confused with excessive non-vital information.

3.4.3 Analyse

Here the data must be examined in order to fully understand how the process works. It is in this stage of DMAIC that root causes of the problem can be found and confirmed using suitable Six Sigma tools.

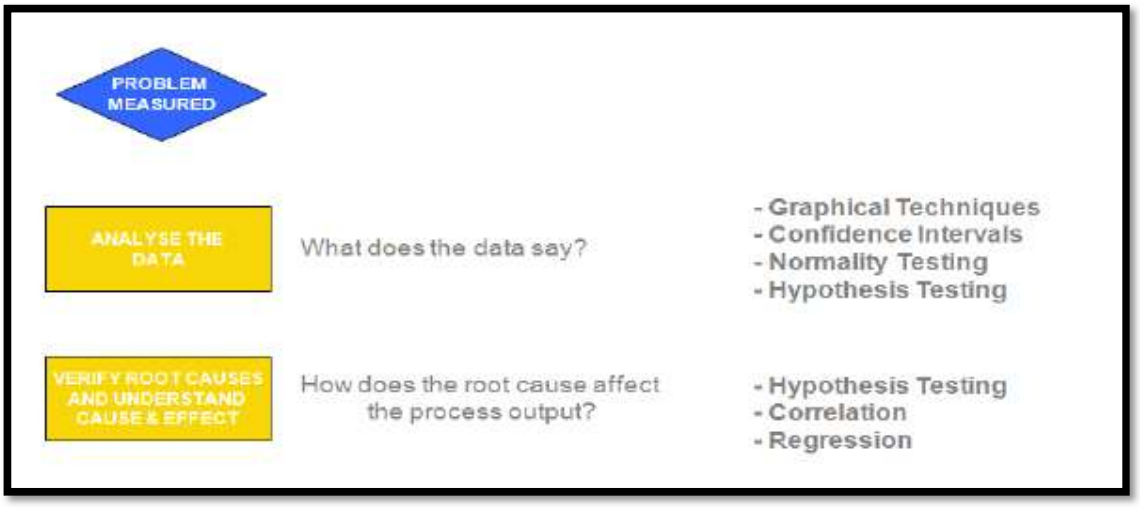


Figure 6: The Analyse phase (Espelosin, 2011)

3.4.4 Improve

With a good understanding of the process, problem and causes it is now time to look at solutions. Brainstorming can be used to come up with as many ideas as possible which can be narrowed down until the ideal solution presents itself. This should preferably be trialled before full implementation to confirm that it will fully deal with the problem. Any issues can then be changed prior to full implementation of the solution.

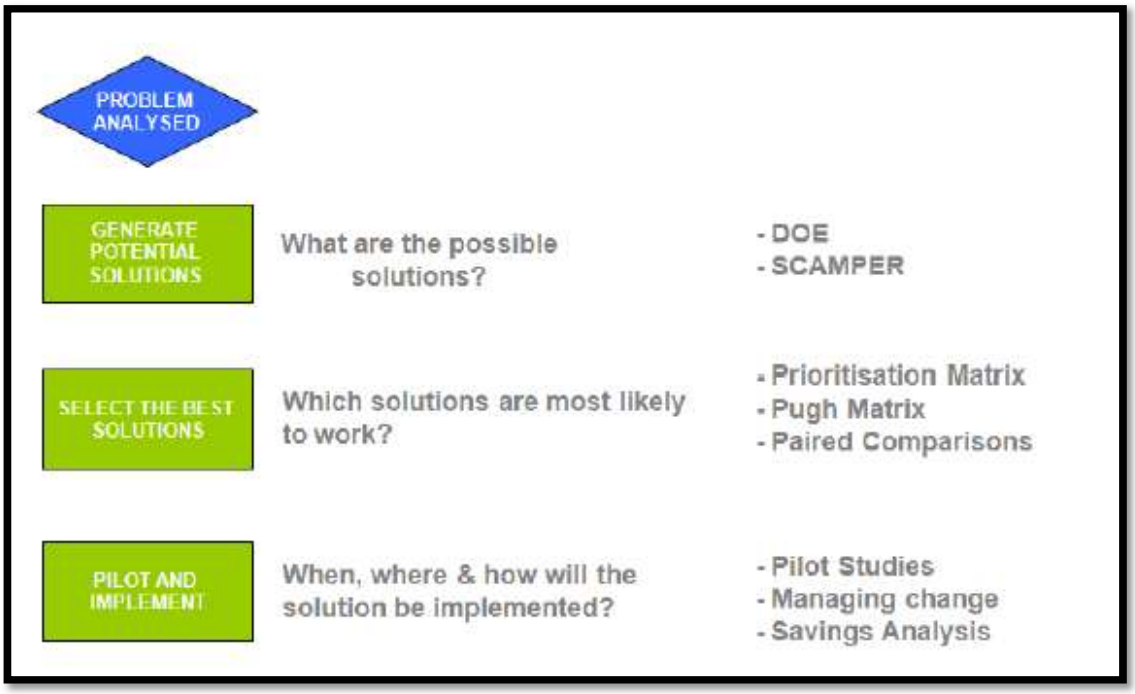


Figure 7: The Improve phase (Espelosin, 2011)

3.4.5 Control

The control phase is the last and arguably the most important. This phase focuses on ensuring that any improvements that have been obtained through the first four steps of DMAIC are sustained in the long term. There is little point in spending time and resources on process improvement if the new solution is not properly controlled and allowed to revert back to the old system. Here it would be pertinent to look back at this project and see if any other areas within the organisation could benefit from the lessons learnt here.



Figure 8: The Control phase (Espelosin, 2011)

4.0 Define Stage

4.1 Problem Statement

As a company, the production performance on the PAG block machining line is not meeting the targeted 24 JPH (jobs per hour). Over a twelve month period, beginning January of 2017 to the end of December 2017, the average production was 19.5 JPH (Appendix 1). Each lost block either represents an engine not produced on the production line or machined blocks needing to be bought in at extra cost. Overall, this is causing assembly shortages and customer dissatisfaction problems that are costing nearly £11,000,000 in reduced throughput. (Appendix 2)

4.2 Scope

Low JPH can only be resultant from the machines in the line, Figure 9 shows that the machines can most easily split into CNCs, Washes and Gantries. This shows the various factors that can contribute to poor production values. There are issues with scrap production at various points though the machining line. However there are currently engineering teams looking into this. The low production rates as a result of poor JPH is an issue that has not been fully addressed, therefore the 'Scrap' arm of the diagram will be excluded for the duration of this project.

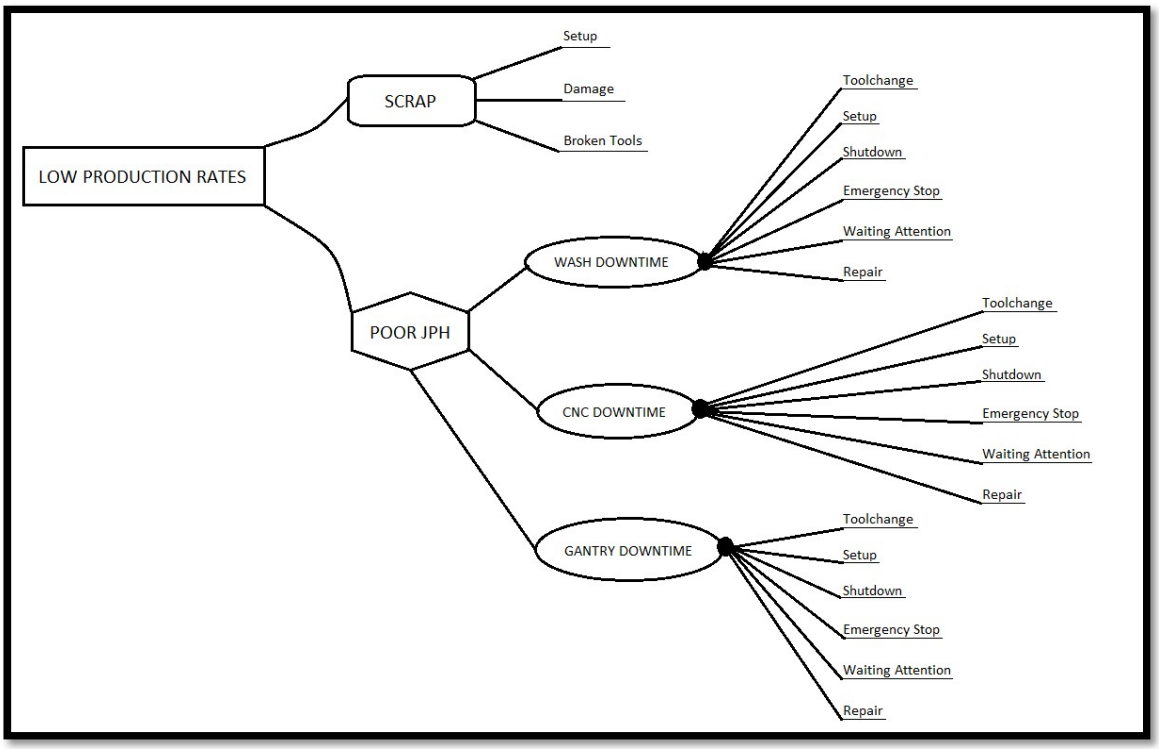


Figure 9: Breakdown Structure, basic reasons for low production rates.

4.3 Quality Characteristics

It is important to establish what priorities are for our customers. We have two sets of customers to the PAG block machining line, internal and external:

4.3.1 VOC - Internal

When a gantry or wash is shutdown the line becomes quickly blocked this means that the machines behind the gantry or wash will be unable to process parts as the completed parts block up the conveyors.
This stoppage will also create starvation of the machines ahead of the gantry or wash in question and will quickly lead to a reduced JPH within the line as a whole.
The PAG block machining line feeds into AJ assembly where the machined blocks are built up into working V6 and V8 engines. If the output from PAG block machining is below target then the assembly line is starved. This causes unplanned downtime on the assembly line, an entire line of personnel will be superfluous until the machined parts become available. The machined blocks are the first part to be inserted onto the line, so assembly is unable to make up a stock of partially built up engines while it waits for blocks. Obviously this effects assembly of the final product and puts production behind. In order to help alleviate this problem machined blocks are currently bought in from Mahle Powertrain in Northampton (Mahle Powertrain, 2018). This has additional cost implications (Finance was unable to provide the values).

4.3.2 VOC - External

The finished engines are taken from Bridgend engine plant to Solihull vehicle assembly plant. Obviously if machining is behind and assembly is behind we will be behind in shipping orders to the vehicle plant. When we are behind target we can not supply the demand from our customer so we loose money in sales. When we are behind target (calculated per annum) we receive fines from the customer for not fulfilling the contracted order (Finance was unable to provide these values).
As shown above and established in the problem statement, the PAG block machining line is not meeting production targets. In a more complex case, or perhaps after this problem has been suitably addressed, the wants and needs of the customer can be ascertained using a variety of methods. Interviews, surveys, focus groups and Kano analysis are commonly used to find out the voice of the customer. As it stands meeting target production is a basic

requirement of the customer. This is known as a dissatisfier when looking at Kano levels. This type of requirement is one that would rarely come out when a customer was asked what features and services they wanted in an engine. This is as it is so basic a requirement that it is considered a given when a customer purchases a product (Figure 10).

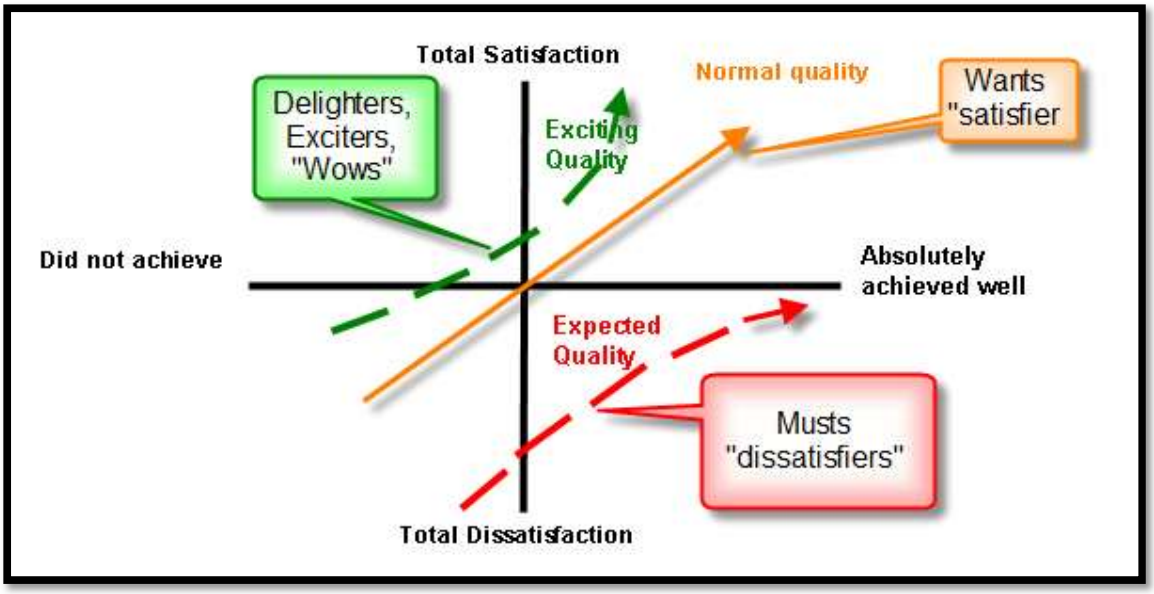


Figure 10: Kano graph showing the three Kano levels. (Six Sigma Study Guide, 2014)

It is a basic principle of customer satisfaction that dissatisfiers are dealt with first, then satisfiers and when these have both been fully recognized and implemented the company can look into providing delighters. This must be done in this order as a customer will not care about a delighter (for example; digital radio provided as standard in a new car) if the dissatisfier has not been fully eliminated (for example: the same car has no engine). It is worth noting that when designed it is likely that the product satisfied well and a number of delighters were incorporated into the package. We can be sure of this as we won the business initially. This problem meeting targets has come about slowly due to machine degradation among other factors. With this problem solved it is likely that the product will shoot up in Kano level, although further study will be needed to verify this.

4.3.3 Deliverables

Six Sigma focuses on critical deliverables, namely cost, quality and schedule.
"Factors critical to cost (CTC) include parameters that impact work in progress, finished goods infantry, overhead, delivery, material and labour, even when the costs can be passed on to the customer. Critical to Quality (CTQ) factors are perhaps most familiar to operational personnel since they directly impact the functional requirements specified by the internal and external customers. Critical to Schedule (CTS) factors impact the delivery time of the product or service." (Pyzdek & Keller, 2015, p.250)
The deliverable that will be used here will be a critical to schedule. The metric that is most commonly used within Ford Engine Plant is that of jobs per hour (JPH). This metric is related to the cycle time of the machines, 252 seconds, and efficiency of the line. When running at 100% efficiency the line can produce 35 JPH. It is because of this easy visualisation that JPH is used.

Area: PAG Block Machining.

Customer Problem: ' Not enough blocks machined to supply demand'

CTS name: Reduced production.

CTS measure: Jobs per hour (JPH)

CTS Specification: Target of 24 JPH

Defect: Current production of 19.5 JPH average.

Unit: One block = one job

Opportunity: Machine availability.

4.4 SIPOC

In order visualise the processes at work a SIPOC diagram was produced (see Figure 11). This diagram and the process map (Figure 12) enable better visualisation and understanding of the entire process and at what points issues can occur.

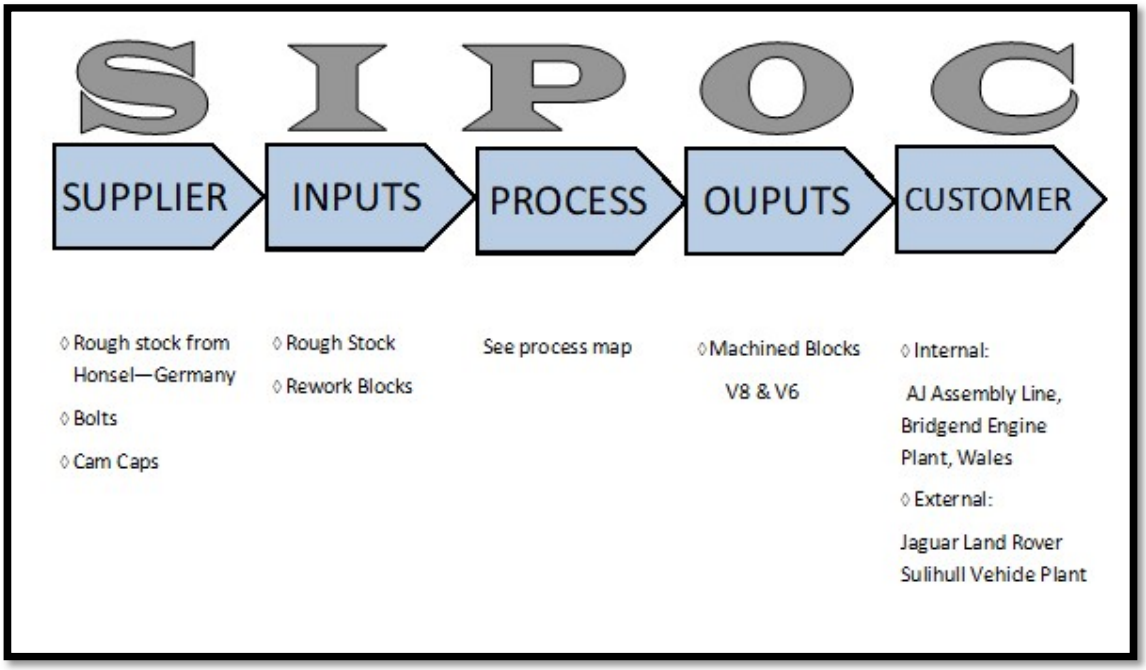


Figure 11: SIPOC diagram for PAG Block Machining.

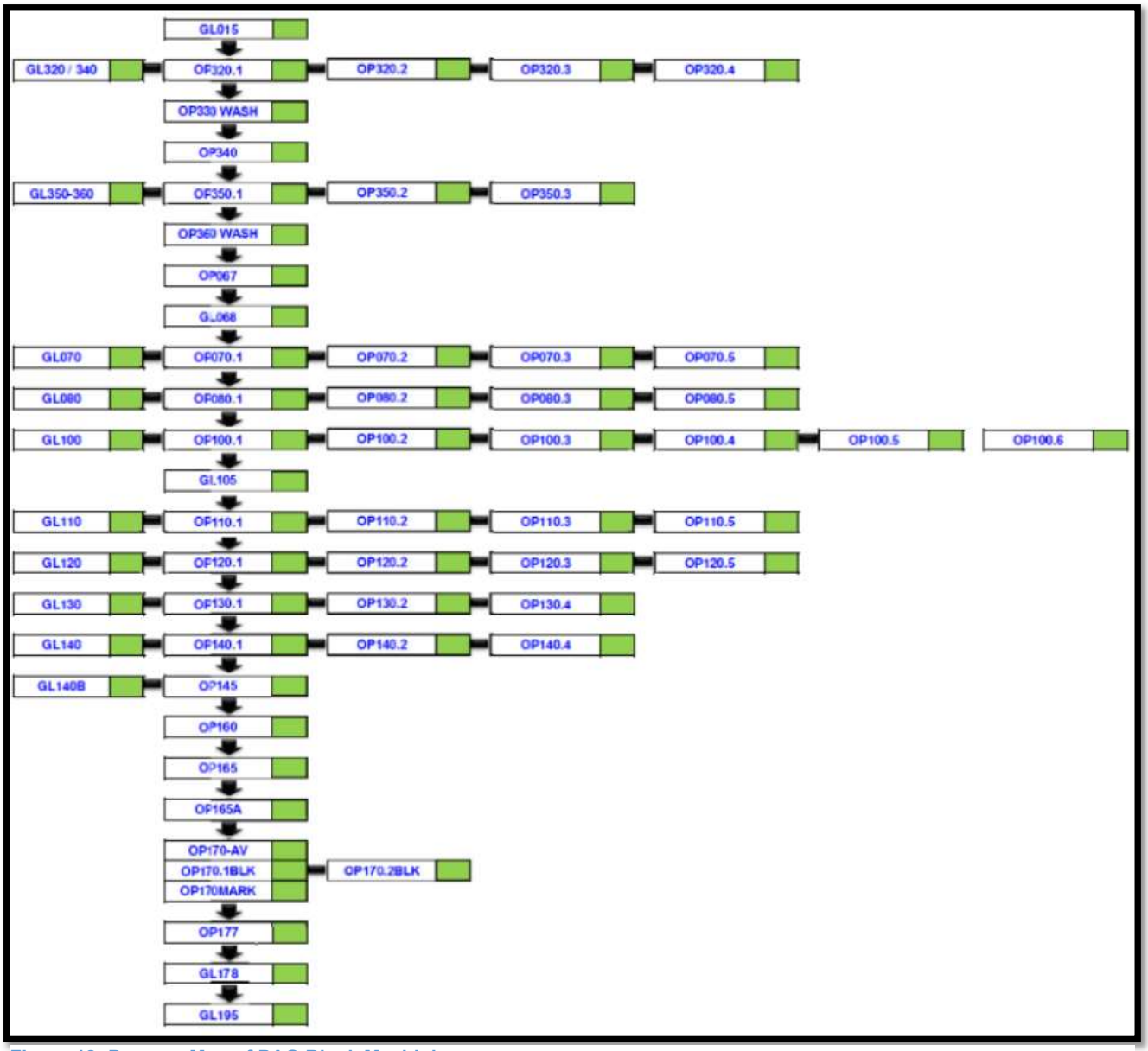


Figure 12: Process Map of PAG Block Machining

5.0 Project Charter

Team: Three persons; Jonathan Richards (MOS Manager), Dan Clark (MMS) & Maria Brooks (ECS)

Scope: Poor JPH, PAG Block Machining, Bridgend Engine Plant.

Project Title: Improvement of poor production scores.

Problem Statement:

As a company, the production performance on the PAG block machining line is not meeting the targeted 24 JPH (jobs per hour). Over a twelve-month period, beginning of January to the end of December 2017, the average production was 19.5 JPH. Each lost block either represents an engine not produced on the production line or machined blocks needing to be bought in at extra cost. Overall, this is causing assembly shortages and customer dissatisfaction problems that are costing in excess of £11,000,000 in reduced throughput. (Appendices 1-3)

Primary Metric: Jobs per Hour

Goal: Increase average JPH from 19.5 JPH to the line target of 24 JPH.

VOC:

Internal; Within process, AJ assembly line, Bridgend Engine Plant.
External; Jaguar Land Rover vehicle assembly plant Solihull

Project Boundary:

This project will focus on low JPH on PAG block machining.

Project Timeline: See Figure 13 overleaf.

Task	Start Date	Duration	Percentage Compleate
Identify Project	18.09.17	7	100%
Team formation	25.09.17	1	100%
Project meetings	25.09.17	1	20%
litriture review	25.09.17	14	100%
Scope of the project	25.09.17	7	100%
Overall problem statement	02.10.17	7	100%
Identify quality characteristics	09.10.17	7	100%
Identify VOC	09.10.17	7	100%
Aims and objectives	16.10.17	7	100%
Write up project charter	23.10.17	7	100%
Data collection plan	30.10.17	7	100%
Collect baseline data	06.11.17	7	50%
Perato diagram of stoppage modes	13.11.17	7	100%
Cause and effect, main stoppage mode	20.11.17	7	100%
Posmon data of shutdown modes	27.11.17	7	100%
Determine main causes	04.12.17	7	25%
Prioritise root causes	11.12.17	7	0%
Identify main root cause	18.12.17	7	0%
Review current process	01.01.18	7	10%
Brainstorm potential solutions	08.01.18	3	0%
Select and prioritise solutions	11.01.18	4	0%
Design solution	15.01.18	28	0%
Cost analysis & order trail parts	22.01.18	7	0%
Trial solution	05.02.18	14	0%
Adjust solution if needed	19.02.18	7	0%
Trial solution again	26.02.18	14	0%
FMEA	12.03.18	7	0%
Consider any maintenance on new syste	19.03.18	7	0%
Risk assessment	26.03.18	7	0%
Brainstorm line roll out plans	26.03.18	1	0%
Select and prioritise plan	26.03.18	1	0%
Cost and impact - break even analysis	02.04.18	6	0%
Order parts	09.04.18	21	0%
Roll out solution to whole line	16.04.18	56	0%
Control charts	16.04.18	7	0%
Implement process controls	16.04.18	7	0%
Ensure all personnel have training	16.04.18	14	0%
Monitor usage and address any issues th	16.04.18	365	0%

Figure 13: Timing plan for project.

6.0 Measure Stage

6.1 Measurement Limitations

When gathering data it is easy to assume that our system records accurate, precise, repeatable and reproducible results. When using information to inform decisions however, it is crucial that the limitations of the measurement system are understood.

6.1.1 Bias

Bias is a term used to describe the difference between a reference value and an observed value. As well as during measurement taking, bias can affect the analysis of results; it can influence these results so that conclusions do not necessarily portray the data faithfully. There are a number of bias types that can be introduced when measuring or gathering data. It important for anyone dealing with data to understand this, reduce the impact of bias and where it cannot be eliminated understand the limitations of the conclusions that are drawn from this data. When undertaking research there are a number of biases that can affect data, such as Design bias, Selection bias, Procedural bias, Measurement bias, Interviewer bias, Response bias and Reporting bias (Shuttleworth, 2009). There are also a number of cognitive bias types that the researcher must endeavour to avoid; some of these are illustrated in Figure 14 (Lebowitz, 2015).
During the course of this project the author has come across several types of bias. When gathering data from POSMON it became apparent that some of the data had been sent to the server incorrectly and in some cases the POSMON interface was down for specific machines over certain dates, this is a form of equipment bias. Anchoring bias was also prevalent when initially gathering data from POSMON, the author initially used the first set of relevant information to compile the data, even though it did not illustrate the trend effectively. It was only by trawling the data and trying several data types that the optimum information was found.



Figure 14: Cognitive bias types (Lebowitz, 2015)

6.1.2 Repeatability & Reproducibility

Repeatability is the variation in measurements when one a person uses one measurement instrument to measure one feature. Reproducibility is the variation of the average measurements made by several different people using the same instrument to measure one feature.

6.1.3 Stability

This is the total disparity when taking measurements on one feature over time. If the measurements are different the system is said to be unstable, this may be due to factors such as temperature effecting parts. When these measurements are the same over different times the system is said to be stable.

6.1.4 Linearity

Linearity is the difference in the bias values throughout the operating range on one measurement instrument, such as a gauge. For example a torque wrench may be -1 Nm out when measuring at its low end but +3 Nm out when measuring at its highest range. Here its linearity bias would be 4 Nm.

6.2 Data Gathering

As previously mentioned the main measurement system that will be used will be POSMON. Vast amounts of operational data are available here. There are some problems associated with this system, some of which have been touched upon here. One of the main challenges of POSMON is the sheer volume of data and the many different ways to access and present the information. This means that in order to navigate it and understand the various metrics, training needs to be completed. Using advice from frequent users enabled the author to find better ways of presenting the needed information and with more relevant metrics.
As well as POSMON, information has been gleaned though interviewing members of PAG block maintenance team. Although useful it is important to remember that this information is often heavily biased, therefore these informal interviews are used as guidelines for further data gathering.
POSMON is a powerful tool and although it lists the states the machines are in, no information is given to say what is being done to correct a problem. This is a problem as a machine maybe awaiting repair as maintenance are busy, no parts are available, the problem requires vendors or specialist personnel etc. In order to help understand the causes of a long period of downtime the PAG block handover book is used. This is very useful as a machine repair that is taking several shifts will almost always be written in but sometimes information written is very basic and it can be difficult to extrapolate the reasons it was taking so long.

Good example of a write up in the handover book:
"Op130.2: Spindle drive faults F229. Spindle unable to go over 7000rpm (needs to reach 9000rpm). Changed drive and downloaded personality module but still the same. Found encoder plug in back was very loose but still the same after tightening. This spindle was changed last week for a different fault. Sorry still down. Suspect spindle." (Ford Maintenance Team, 2017)

Poor example of a write up in the handover book:
"Op100.2: Changed valve, still occasionally faulting out. Running?" (Ford Maintenance Team, 2017)

Even though a poor write up offers little information, at least it was documented. A large majority of repairs are not written up because they were completed in one shift. This is all

well and good if it's a one off problem but it makes it very difficult to track issues that are long term or in the case of this project, specific repairs relating to specific instances of downtime.

7.0 Analyse Stage

7.1 Scope

Poor JPH can only be resultant from the machines in the line, Figure 9 shows that the machines can most easily split into CNCs, Washes and Gantries. Looking at the downtime for each type of machine JPH data from POSMON (Appendices 4-6) total downtime in JPH was collated into Table 1. A Pareto chart can be produced from Table 1 and used to help pick the first target for improvement. Figure 15 shows this data graphically. Here lost JPH is higher from gantry downtime than either CNCs or the washes.

Downtime by Machine	Downtime JPH	Cumulative %
Gantry Downtime (JPH lost)	2.48	57.37
Wash Downtime (JPH lost)	1.32	87.91
CNC Downtime (JPH lost)	0.52	99.94

Table 4: Lost JPH per machine type over a three month period (August - November)

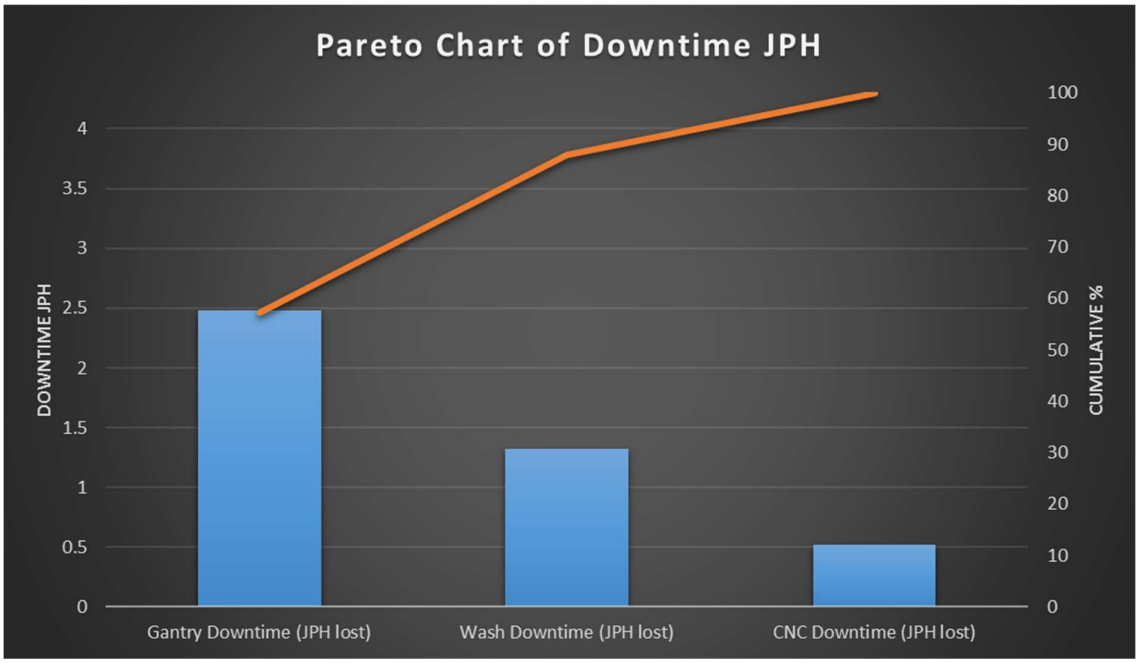


Figure 15: JPH lost information from Table 1 presented as a Pareto chart.

Note: The value used for the CNC downtime JPH is the total from all CNCs (2.08 JPH) divided by four. This is as each cell has an average of four CNCs. To use the 2.08 JPH insinuates that if one CNC is down production is stopped in the area, this is not the case. In reality each cell is built with excess capacity, anywhere from 44 JPH to 80 JPH when the capacity of the entire line is 35 JPH. Although this dividing by four is simplistic, there is no need to calculate to a more accurate degree as the CNC downtime still would not be the main contributor. The value of 0.52 JPH will be used.
POSMON favourably splits JPH into several categories useful for monitoring machines in cycle and stoppages. It is the five categories that cover stoppages that are relevant to the gantry downtime and will be looked into. The state of the machine during each category is not immediately obvious; data sheets were obtained from the IT department so that a better understanding of these metrics could be established (Appendices 7 & 8).

7.1.1 Setup: The machine is in the setup mode as indicated by the setup switch or machine running though a setup procedure. I.e. the PLC tells POSMON: Control power present, machine not in auto, Changeover or Process Change is selected.

7.1.2 Tool change: The machine has been requested to go to a tool change position either by push button request or automatically by means of an elapsed tool counter and tool change is in progress. I.e. the PLC tells POSMON: Control power present, machine is not in auto, tool change is selected.

7.1.3 Waiting attention: The machine has detected a fault (could be monitoring fault, internal fault, interlock fault, time out etc.) and is awaiting manual intervention to clear the fault. I.e. the PLC tells POSMON: Control power present, machine is in fault mode.

7.1.4 Repair: The machine was previously in 'waiting attention' and intervention has begun. It will remain in repair until it is put back into cycle. I.e. the PLC tells POSMON: Control power present, machine is not in auto, manual intervention bit is true and previous status was 'waiting attention'.

7.1.5 Shutdown: The machine has been either been turned off (power locked-off), the machine has been requested to stop at end of cycle or automatic mode is not selected. I.e. the PLC tells POSMON: Control power is off or machine in not in auto or manual intervention bit is true and the previous status was not 'waiting attention'.

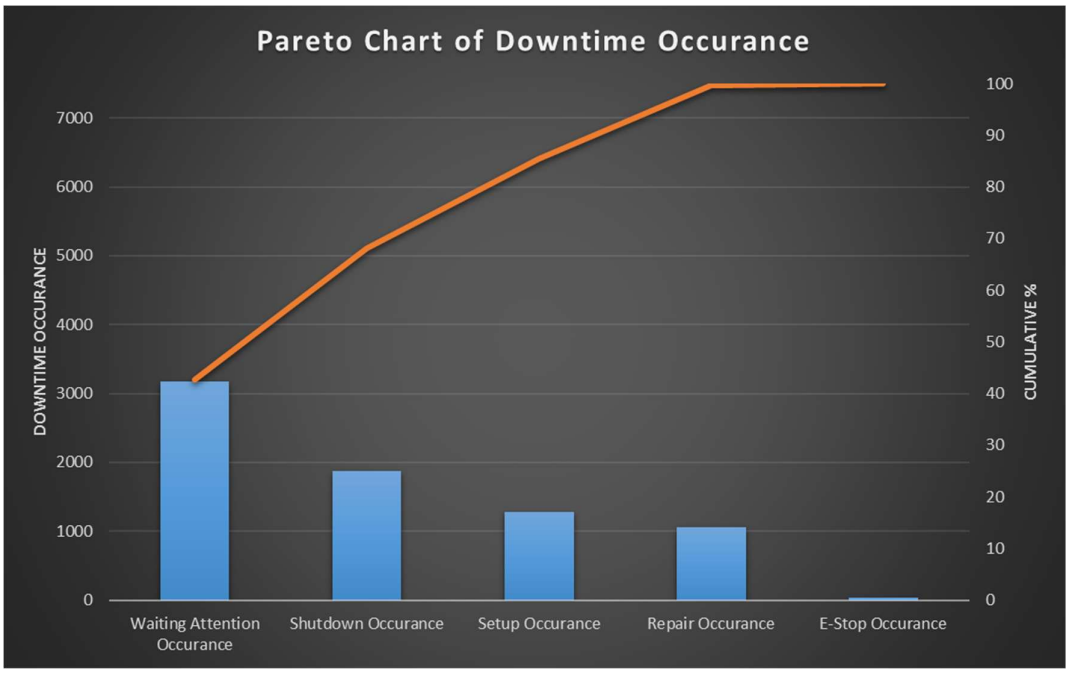


Figure 16: Pareto Chart showing occurrences of various stoppages on the gantries over three months

Information for Figure 16 was gathered from POSMON data, appendices 9 & 10. Figure 16 shows the Pareto chart for the five types of stoppage as used in POSMON. The occurrences of waiting attention are defined on POSMON as a machine that is in a fault situation that has not yet had manual intervention. Ford working policy states that the machine operator should attend a machine in this state. The operator will on some occasions be able to get the machine back into cycle; basic faults such as tool changes, over-cycle, set-up etc. can be dealt with on the spot. If the fault is above their skill base they should immediately talk to a supervisor who will notify maintenance to attend the machine. Maintenance should attend the machine as soon as is viable between other jobs. In the authors experience machines awaiting attention will often go long periods before an operator will attend, this is due to manning issues and various political problems surrounding job descriptions. Similarly, maintenance will often take a while to get around to these as they are seen as low priority jobs or they may say “we can only do one job at a time” and prioritise a larger job that they may be on already. These factors heavily indicate to the author that these waiting attention occurrences are mainly due to management based problems. Six Sigma projects although versatile do not lend themselves to management based problems (Pyzdek & Keller, 2015). It is for this reason that this largest bar will be discounted in this project and the information gleaned here will be passed on so that it can be dealt with in a different way. When looking at Pareto charts normally we would see a few very tall bars, and it works out that around

20% of the issues account for 80% of the impact (Eckes, 2003). This is not the case for Figure 16. As previously discussed PAG Block Machining is notoriously bad at producing to target so it is expected that many problems are the cause, Figure 16 shows this. The implications of this are that more projects will have to be carried out in order to help overall production. Going forward the second bar of 'shutdown occurrences' will be investigated further, with recommendations to look into the other causes at a later date.

Detailed information on gantry stoppages was gathered from POSMON. This was segregated into set-up, tool change, awaiting attention, repair and shutdown. All information of non-shutdown stoppages was removed, leaving just relevant data. This included the dates, times and durations of each shutdown event over a three-month period (Appendix 11). This data was littered with vast numbers of very small shutdowns under twenty minutes that would often be attributed to problems such as air leaks, dirty / out of alignment sensors or replacements of locators. A simple Pareto chart was generated to show the split of time between these long and short shutdown instances. Figure 17 shows the split between total time of instances less than twenty minutes and total time of instances over twenty minutes for this three-month period. Time periods over twenty minutes are highlighted in Appendix 11 in red.

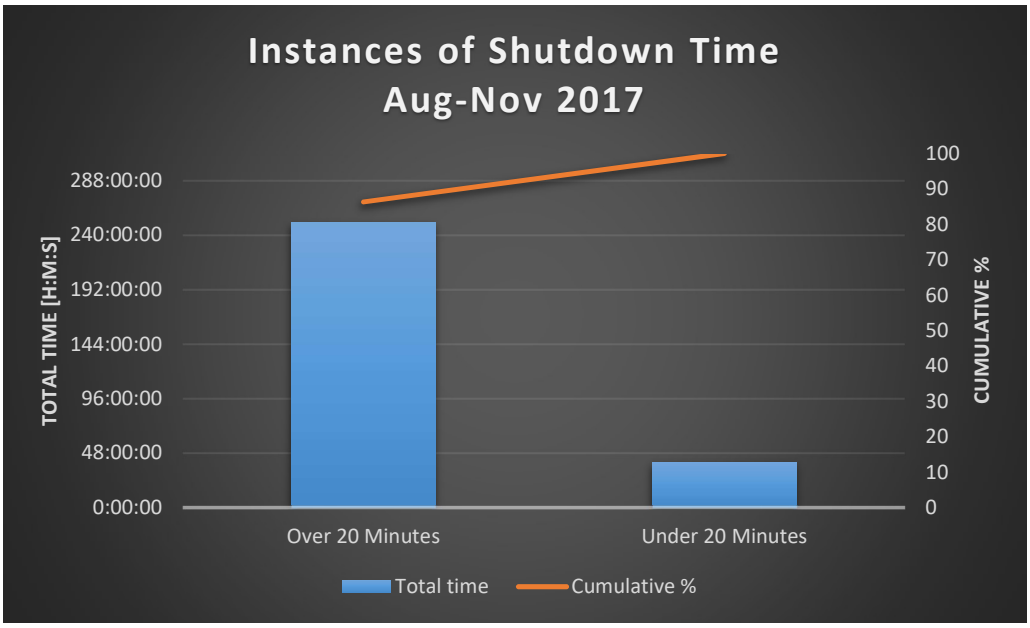


Figure 17: Pareto chart showing the total down time that long and short shutdowns contributed to.

Figure 17 illustrates the classic Pareto principle 80:20 split (Eckes, 2003). Although the number of instances is low, the shutdowns of over twenty minutes' accounts for nearly 80% of the downtime. It is these longer instances that are most impacting the JPH.

7.2 Cause and Effect Diagram

A cause and effect diagram aka fishbone diagram will be used to analyse the possible root causes of shutdown time of the gantries (Figure 18). This method is not used primarily to find the most important issue but to remove some of the more trivial issues (Wedgwood, 2006).

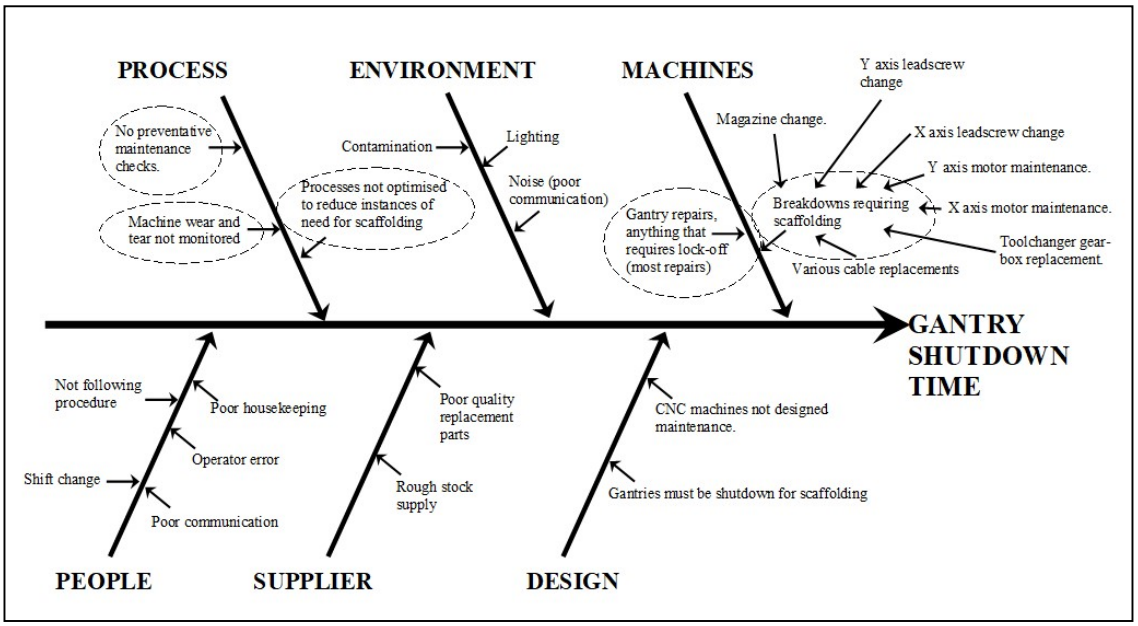


Figure 18: Cause and effect diagram of gantry shutdown time.

7.3 Root Cause Analysis

Using the handover book along with the cause and effect matrix (Figure 18) the longer instances, of over twenty minutes, were coupled with available information on the problems causing downtime. This is shown fully in Appendix 12 with an excerpt in Table 2, for instances where no information was written in the book the reason was left blank.
When compiling data from POSMON and the handover book, several gaps became apparent in the available information. Although some instances of scaffolding erection could be found, only a small number of instances of the removal of scaffolding were documented. As these removals must have taken place and therefore must be documented in POSMON, the author has taken an educated guess as to what remaining shutdown times are most probability attributed to the scaffolding removal. These presumptions have been highlighted in green.
Several instances of downtime found in the book were not shown on POSMON. This was limited to the operation 80 and 320 gantries. There is no POSMON data on these gantries at all for the time period in question. During this time there must have been a communication issue between the gantries and the POSMON server. The 80 and 320 gantry problems have been added into Appendix 12 with estimated times listed. These have been highlighted in yellow.

Equipment	Start Time	Duration (HH:MM:SS)	Handover Book Explanation	Downtime type
GL320	04-08-17 0:00	1:20:00	Operation 320.3 needs a new tool magazine. Cell shutdown for scaffolding	Scaffolding
GL140	27-08-17 13:50	0:37:03	Two air leaks found and repaired.	Air leak
GL140	27-08-17 16:20	0:27:02		
GL140	28-08-17 19:44	0:49:38	Watchdog fault, Proxy cleaned and gantry reset	Cleaning
GL140	28-08-17 21:47	1:22:29	Gripper locator damaged. Gantry lowered into SPS for replacement.	Part Replaced
GL140	29-08-17 16:35	0:23:11		
GL140	29-08-17 19:23	0:22:40	Air leak found and repaired.	Air leak
GL140	30-08-17 5:43	0:31:43	Down with clamping fault. Suspect part clamp valve passing. Part ordered	Investigation
GL140	30-08-17 6:58	0:36:11	Clamping fault awaiting part	Awaiting Part
GL140	30-08-17 13:35	0:28:58	Down with clamping fault. Part replaced	Part Replaced
GL015	31-08-17 0:44	0:59:55	Lube fault. Lube manifold cleaned, seized parts replaced.	Part Replaced
GL067	02-09-17 17:23	12:56:14		
GL068	04-09-17 5:40	0:25:44		
GL068	04-09-17 17:45	0:26:43	Conveyor stop below incoming gantry conveyor not raising in the allotted time frame.	Part Replaced
GL068	05-09-17 2:33	0:32:38	Gripper showing part present after depositing block. Swarf stuck to proxy.	Cleaning
GL068	05-09-17 3:26	0:43:39	Lube fault. Lube manifold cleaned, seized parts replaced.	Part Replaced
GL068	05-09-17 18:15	0:39:20		
GL070	06-09-17 20:02	0:23:21	Watchdog fault, Proxy cleaned and gantry reset	Cleaning
GL110	07-09-17 17:08	1:32:53	Marposs receiver on 110.4 faulting out with no signal. Receiver full of coolant and needs replacing. Gantry down for scaffolding erection	Scaffolding
GL068	08-09-17 15:02	0:29:03		

Table 5: Excerpt from Appendix 12, showing the collation between POSMON data and handover book information.

Downtime type	Collective time [H:M:S]	Collective time [Days]	Cumulative %
Scheduled Maintenance	85:40:42	3.57	32.46600691
Unknown	78:42:13	3.28	62.28908916
Scaffolding	31:50:30	1.33	74.35482071
Crash	26:58:44	1.12	84.57790465
Part Replaced	22:36:40	0.94	93.14591083
Reteach	5:05:47	0.21	95.07708048
Air Leak	4:16:08	0.18	96.69468636
Investigation	2:55:22	0.12	97.80221168
Cleaning	2:45:36	0.12	98.84805578
Reset	2:26:13	0.10	99.77148475
Awaiting Part	0:36:11	0.03	100

Table 6: Collated information from Appendix 12.

The data shown in Appendix 12 was collated into Table 3 which allowed a further Pareto chart to be drawn. Figure 19 shows the weightings for various causes of shutdown time. Here it can be seen that the largest contributor to the longer shutdown times is scheduled maintenance. This is not strictly true as the scheduled maintenance shown was done over two days but is showing 3.57 days. This is as several of the gantries were shutdown over this period at the same time; because of this the peak is much higher than it should be. Scheduled maintenance is a good strategy for helping to reduce the costs associated with a line that primarily deals with reactive breakdown maintenance. The second peak is that of the unknown shutdowns. These unknown shutdown instances are because of poor bookkeeping on the part of the maintenance team. From experience the author can say that it is likely that some of these downtimes are due to slow reaction times on the part of operators, normal reactive maintenance and scaffold erection and removal. The first definitive peak is that of the erection and removal of scaffolding.

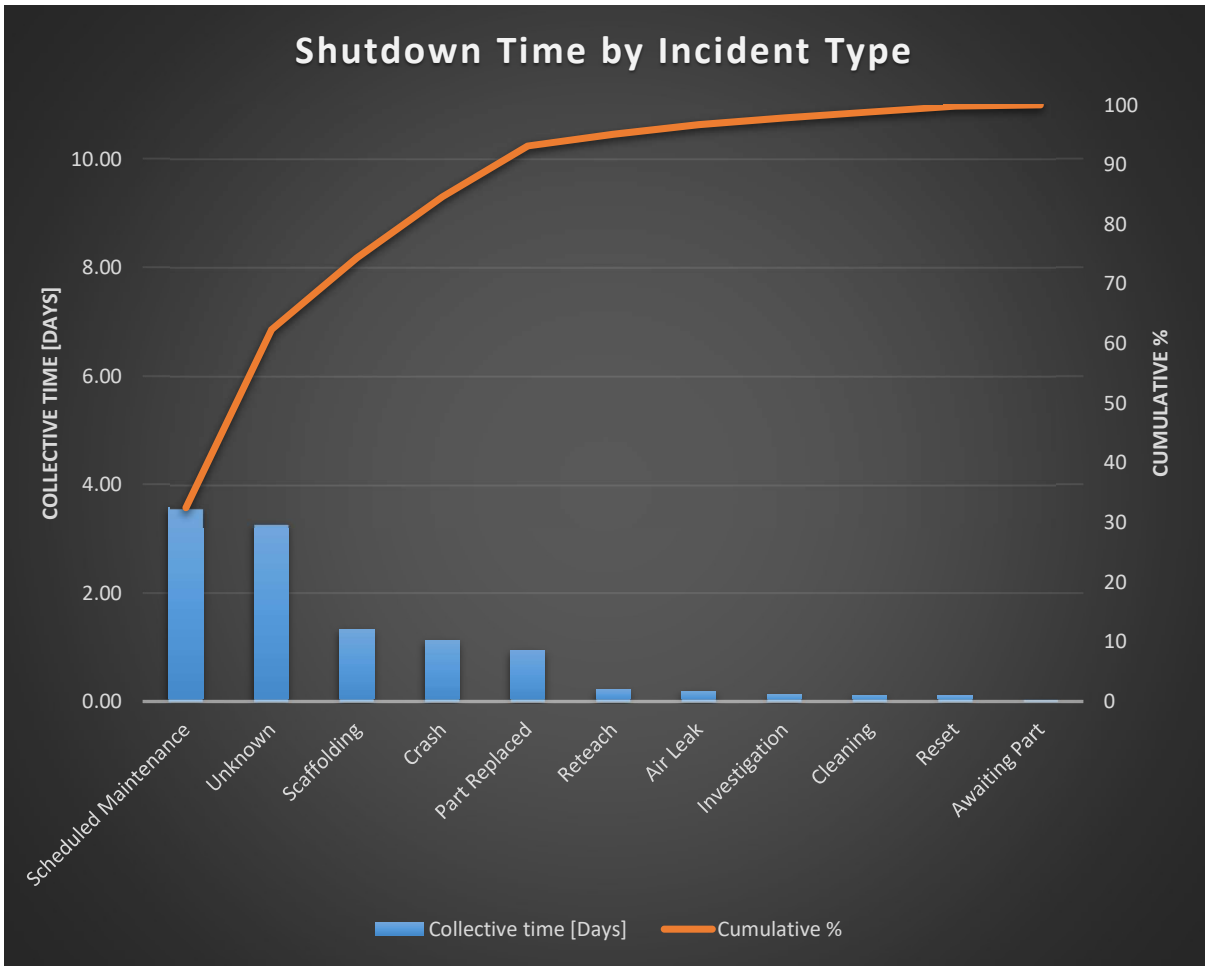


Figure 19: Pareto chart showing total shutdown time by incident type.

7.4 5-Whys

To further understand the reasons for the high loss associated with scaffolding the 5 whys will be used. Note: information will also be used from the cause and effect diagram in Figure 16 to allow conclusions to be drawn.

- Why is the gantry down for the erection/removal of scaffolding on CNCs?
  - Safety, in order for the contractors to safely work on the CNC machines within the cell the gantry must be shut off.
- Why is scaffolding needed?
  - Because maintenance must gain access to the tops of CNC machines.
- Why must they have access?
  - To repair the CNC machines, safety dictates there is guarding in place when working atop the CNCs.
- Why must the CNCs be repaired?
  - Failure of components.
- Why have the components failed?
  - Due to a lack of preventative maintenance.
- Why is there a lack of preventative maintenance?
  - Maintenance personnel do not have the time to carry out any preventative maintenance tasks as breakdown maintenance takes up all of their time.

Looking at the root cause of these five whys it can be seen that poor maintenance practices are a leading cause of repairs that need scaffolding. From interviews and experience the author can say that this problem of little to no preventative or scheduled maintenance is not isolated to just repairs that need extra access. There is a line wide problem with maintenance personnel not being given time to complete scheduled maintenance as well as operators not performing checks and cleaning of the machines. This issue has been highlighted before as PAG block has the highest costs of replacement parts in the factory. Due to this and problems with CNC downtime, management are currently in the process of setting up a dedicated preventative maintenance team. This new team will be tasked with:

- Documenting the condition of the machines so that slow degradation can be spotted and rectified prior to breakdown.
- Checking the condition of the machines and flagging up areas that need cleaning or extra attention.
- Performing scheduled checks according to the manufactures documentation.

- Replacing parts that commonly fail to reduce unplanned downtime. i.e. batteries, filters, belts etc.

The full implementation of this preventative maintenance team should help to deal with some of the problems that are causing the poor JPH. This is not however the complete solution to this problem. The advantages of reduced breakdowns will not be instant, it is not going to completely stop the need for access to replace/repair damaged parts and most importantly the preventative maintenance team will need access to the tops of the machines themselves in order to carry out some of their tasks.

This cause and effect analysis has highlighted the current and continuing need for access to the tops of CNC machines that will reduce the shutdown time of the gantries.

7.5 Current Scaffolding Process

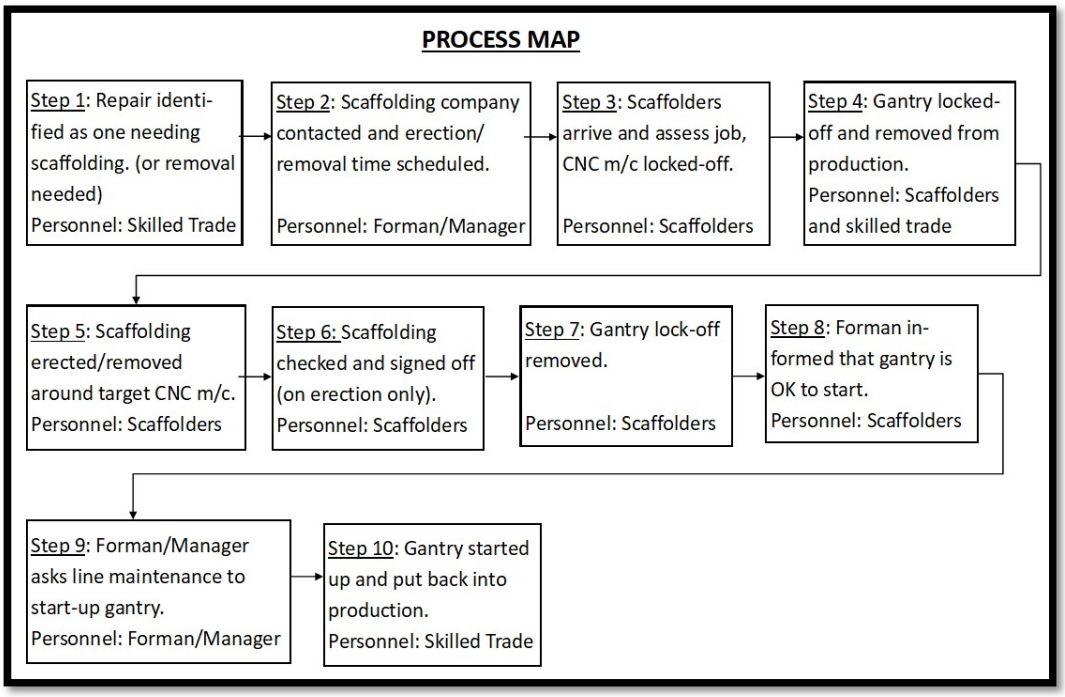


Figure 20: Process map showing the current approach to scaffolding.

When scaffolding is needed the procedure shown in Figure 20 is followed. This is disruptive to the line for several reasons. Initially when working on the CNC in question the maintenance personnel are unable to complete the work due to access issues so the job must be left and scheduled in for when the scaffolding is up. This obviously affects the mean time to repair of the machine. The Forman/Supervisor must schedule in the scaffolding; this is an issue as previously mentioned because the gantry must be shutdown so that the contractors can erect the scaffolding safely. This gantry downtime is also an issue for scaffolding removal. The contracted company "Direct Hire & Scaffolding Company" charges £740 per scaffold used so long as it is erected during normal working hours (Appendix 3). From interviews and experience the vast majority of scaffolds that would affect a gantry are erected during the normal working hours. This is as engineering staff give the go ahead for the erection and would only be called outside of 7.30am-4pm working hours if the problem was a line stopper i.e. a problem with a gantry itself or a wash. Note that Appendix 3 is a single month quote for the whole plant.

From Appendix 12, over a three-month period, a total of 13 instances of scaffolding usage were recorded. This gives a total of £9620 (13 x 740 excluding VAT) in just scaffolding costs.

As previously stated there is no assurance that these thirteen instances were the only scaffolds erected during this timeframe so this figure can be seen as minimum cost for the three-month period.

Clearly it can be seen that better access would not only enable the preventative maintenance team be able to fully accomplish their jobs but JPH should improve and scaffolding costs will be reduced.

8.0 Improve

8.1 Selection

In order to improve upon the baseline of scaffolding erection, a system needs to be developed that either removes the need to put the gantry into a shutdown state or reduces the downtime. Initially a brainstorming session was carried out to get a good range of possible ideas. These ideas were arranged in a concept selection matrix (Table 4).

Initial Ideas	Cost per machine to implement (0=free to 10=expensive)	Safety 0=compliant to HASWA 1974 to 10=not compliant to HASWA 1974. Values between indicate research needed)	Simplicity (0=Within available skill set to 10=too complex or requires outsourcing)	Ease of use (0=Minimal hassle to access to 10=very difficult to use)	Machine Downtime (0=Short one off machine shutdown to 10=extra machines shutdown with every use)	Total Lower values are better
Current scaffolding	5	0	10	0	10	25
Minitec Guarding	6	3	4	2	2	17
Sliding gantry curtain	8	2	4	5	3	22
Access from one CNC in cell, board walk.	3	5	6	6	10	30
Key-Clamp Guarding	4	2	2	2	1	11
Permanent Scaffolding	6	0	10	0	10	26

Table 4: Selection matrix from brainstormed ideas.

Total scores: 0-24=Most feasible 25 = as good as the current solution 26+= impractical

The ideas in the table that are the most practical are the ones with the lowest scores. These are the Minitec Guarding, Sliding Gantry Curtain and Key-Clamp Guarding. Further critical analysis of these methods is needed to pick the final idea.

8.1.1 Minitec Guarding

This idea consists of constructing individual enclosures around the tops of the machines using Minitec extruded aluminium bars. This ideally would be constructed on the floor and crane lifted into situ.

Pros:

1) Materials are readily available for a prototype, at no extra cost to the company.
2) Simple construction; lengths only need to be cut to required size, ends threaded and all fixings can be installed with just an allan key.
3) Relatively cheap; one machines worth of guard is estimated to cost around £680, less than the cost of one scaffold installation. (Minitec, 2017)

Cons:

1) Fine tolerances, everything must be cut and constructed to the exact specifications, this is fine for most machines but there are several minor differences between machines of the same type. These differences include, extraction pipes in slightly different locations, gantry trays encroaching on the tops of machines more in some cells, electrical cables routed in different directions on some machines etc. This would mean that each machine would need to have a separate drawing made up for it and guarding customised to each.
2) While this system is used on floor level guarding, there is no mention of it used in this way in the manufactures documents. This means that there is a likelihood that each guard would need to be load tested at extra cost in order for it to comply with Health and Safety at Work etc. Act, (1974).

8.1.2 Sliding Gantry Curtain

This idea is to construct one sliding curtain per cell; this curtain can be moved over to the machine that access is required on. The scaffolding can then be constructed atop the machine without the need to place the gantry in shutdown.

Pros:

1) Relatively quick to put into use.
2) Could be suspended from the stanchions and steel cross members of the building itself.
3) When needed it can simply be slid over to the machine that needs it.

Cons:

1) Each cell would need individual planning to enable the curtain to fit and function as desired.
2) Still means that scaffolding need to be scheduled in. This would be ok for the rarer breakdowns but is going to end up costing extra as the preventative maintenance team starts to use it.

8.1.3 Key-Clamp Guarding

This is similar to the Minitec guarding idea but using a different construction system. Again the guard is built atop the machine, preferably in sections, and lifted using a crane into situ.

Pros:

1) Cheaper than Minitec, cost of one guard would be £550. (Key-Clamp Store, 2017)
2) Very Simple construction; lengths only need to be cut to required size. Fixings are placed over the pipe and tightened using an Allan key.
3) Tolerances are quite loose which means that a single design can be used. Small adjustments can then be done in situ for each machine.
4) Website (Key-Clamp Store, 2017) lists key-clamp as a suitable guard for this application providing the tube of diameter 42mm or higher is used.

Cons:

1) As the poles are clamped in place there will need to be regular maintenance to ensure the guarding is still sound and that the bolts are still tightened to a torque of 40Nm (Key-Clamp Store, 2017)

Idea	Pros	Cons
Minitec Guarding	3	2
Sliding Gantry Curtain	3	2
Key-Clamp Guarding	4	1

Table 5: Pros and Cons of the lowest scoring ideas in Table 4.

This method shown in Table 5 shows that the Key-Clamp Guarding has the most pros and least cons. This method agrees with the weighting method performed earlier which gave this idea the lowest score and therefore indicating that it is the most practicable. It is worth noting that looking at just cost and safety it scores best. From these critical analyses it is seen that the Key-Clamp Guarding would be the preferable idea to implement.

8.2 Safety Considerations

This guarding must be safe in order to be able to pass initial inspections by Ford implant safety department. Much information was available in the manufactures documentation (Key-Clamp Store, 2017)

- All vertical supports must be one unbroken piece
- No joints should be welded
- Hex bolts maximum torque of 15Nm
- Setscrews (Allan heads) must be tightened to 40Nm, Sharp end of the screw must face inwards to connect with the pole. If constructed to this specification 900Kg.
- Key-Clamp guarding is rated fit for purpose for everything except crowd loading situations (football stadiums, auditoriums, theatres, etc.)
- Post separation of over 2500mm not recommended.

In-plant safety was questioned over legislation giving the following considerations.

- When installed at a height guarding must be as secure as reasonably practicable. Attachments to the machines must be done to the main body of the machine i.e. parts that cannot be removed by hand and are secure.
- Clip rails for harnesses would not be needed as they currently are not used for scaffolding so no extra consideration needs to be made.
- Load testing is not needed as it will not be used for hoisting, only to prevent people from toppling off the machine
- Some variety of screen must be installed to prevent users from gaining access to the moving gantry.
- Guarding must not be able to be interfered with without the use of specialised equipment i.e. you should not be able to dismantle it by hand.
- The rail bars must be at a height of 475mm and 950mm from the platform floor. This is to prevent people toppling over the edges.

8.3 Design

8.3.1 Specht 500D CNC

The first major issue was how to attach the guarding to the machine in a suitably strong location. This required some prototype parts but the idea was to try and find a way to attach the uprights quickly in order to avoid more gantry downtime. It was decided that the best, most secure points of attachment would be to utilise the lifting points on the machines. This meant that so long as suitable fixings were available the guard could be made up and bolted into these points with minimal gantry downtime while construction took place.
For the Specht 500D CNC machines, four suitable lifting points were identified that could be used, two on the gantry side of the machine and two at the back end of the machine. In order to fix the Key-Clamp system to these points an adapter needed to be made. For the two M30 lifting points one the back end of the machine there were many preliminary designs, eventually settling on the parts shown in Figure 21. This was made up in the in-plant tool room. This is attached to the machine via M30 stud bar and the Key-Clamp base is then threaded into the bottom plate. For the two M16 lifting points in the gantry side of the machine it was decided that the Key-Clamp base could be directly bolted into them. From these points the design specification was to enclose the top of the machine so there was no way for someone to fall out. Entry was to be gained from the magazine side of the machine. The whole of this side can be left open as no one should be working on the machine without a suitable work access platform in place. The final design for the 500D can be seen in Figures 22-25.

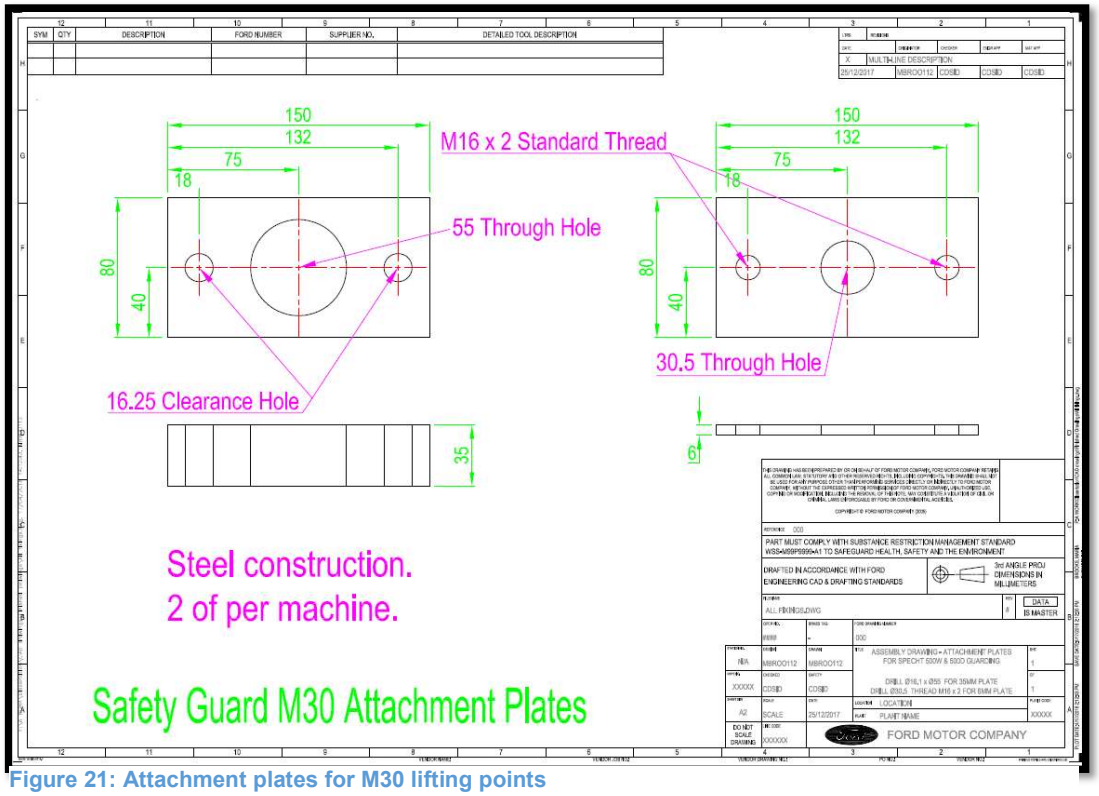


Figure 21: Attachment plates for M30 lifting points

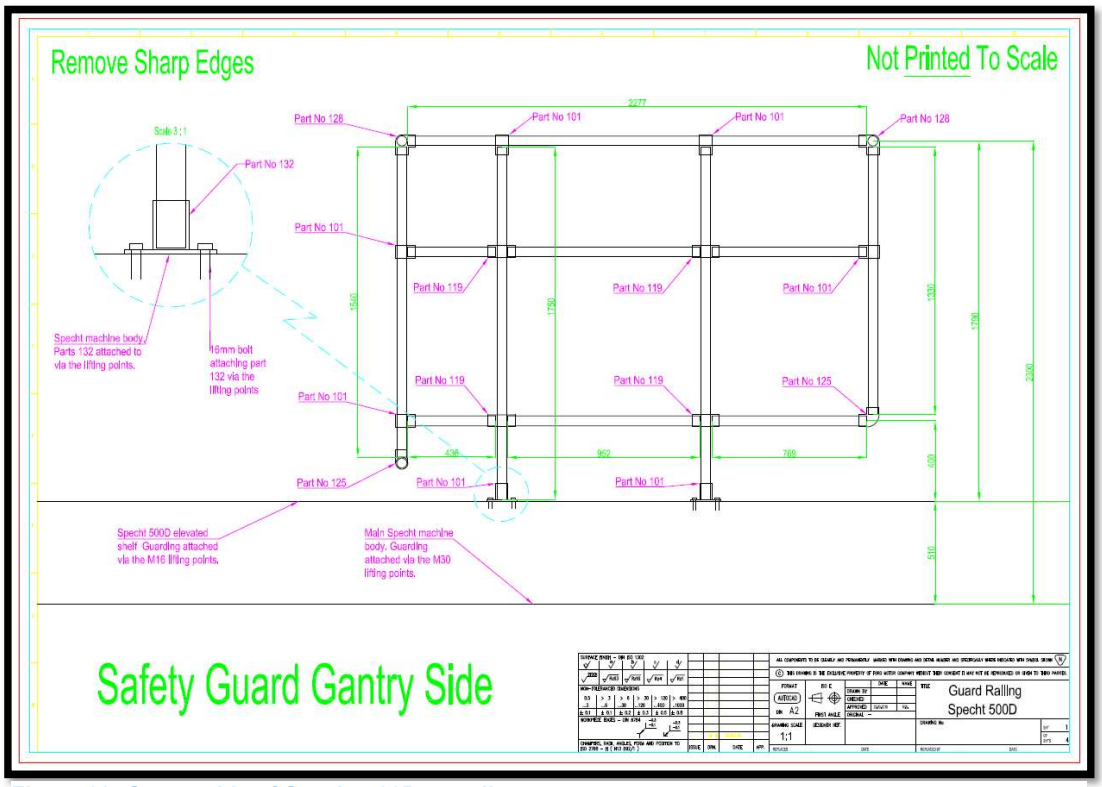


Figure 22: Gantry side of Specht 500D guarding

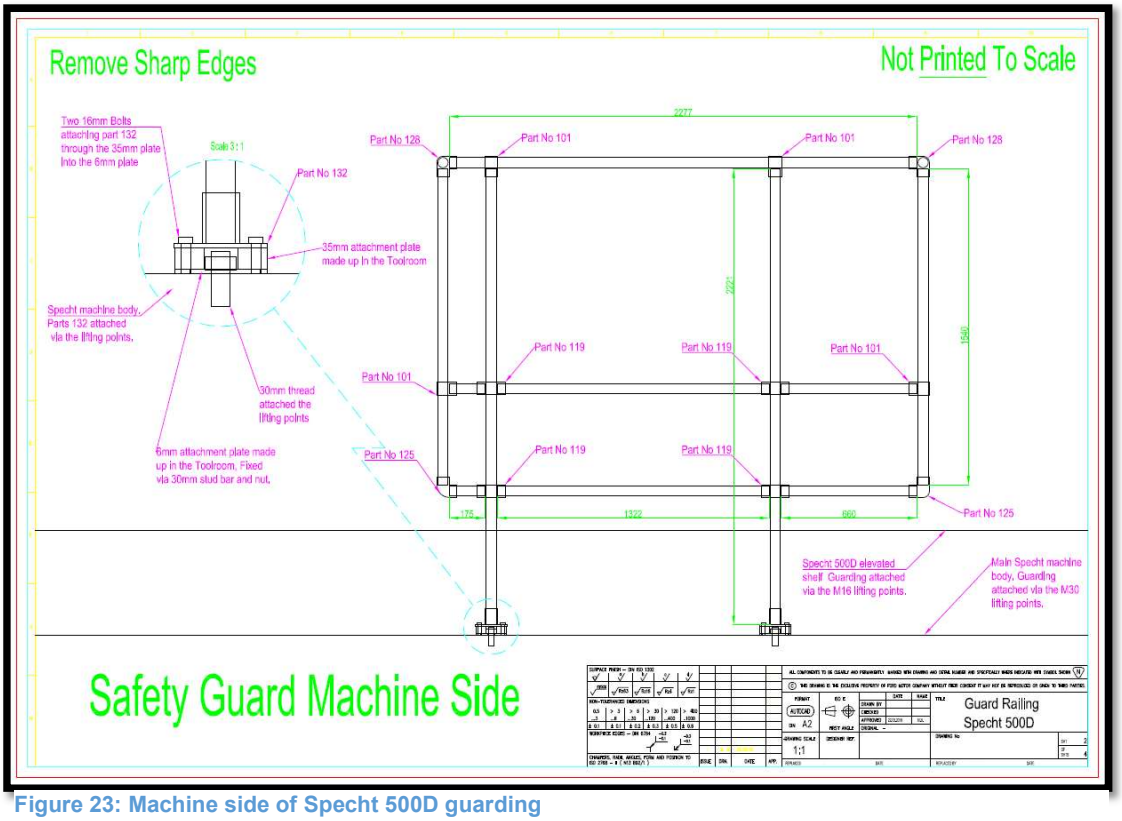


Figure 23: Machine side of Specht 500D guarding

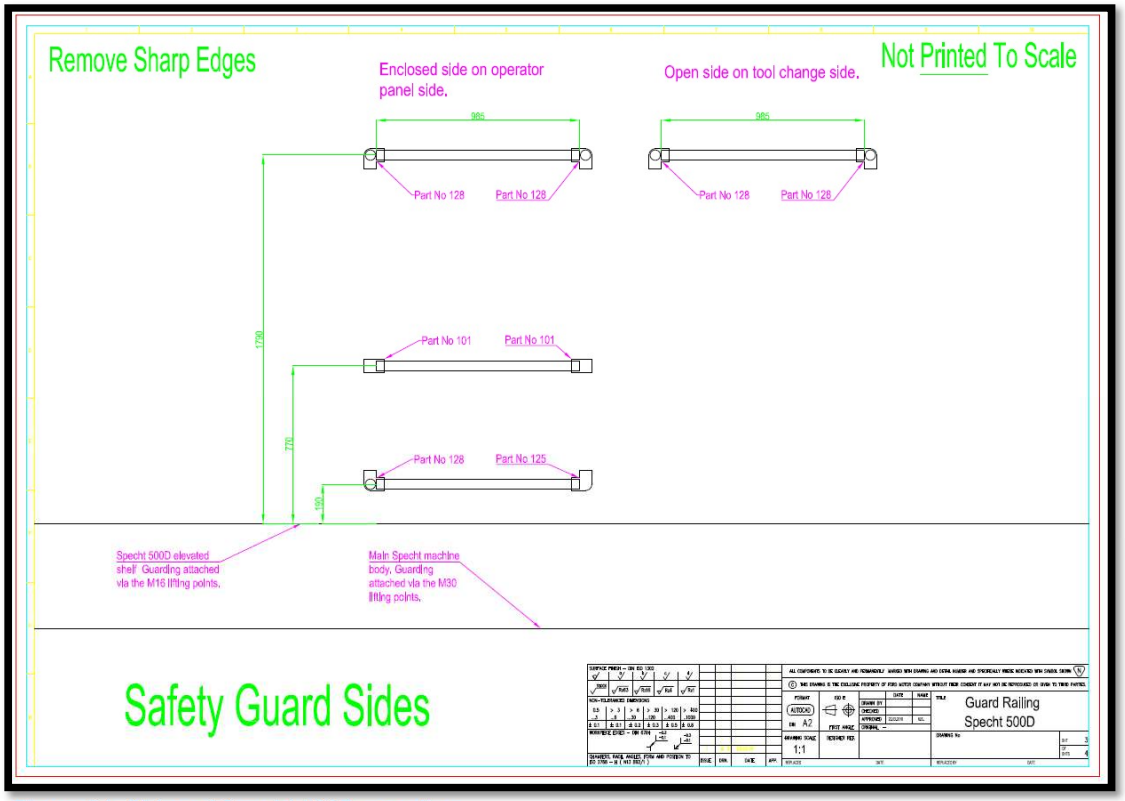


Figure 24: Sides of Specht 500D guarding

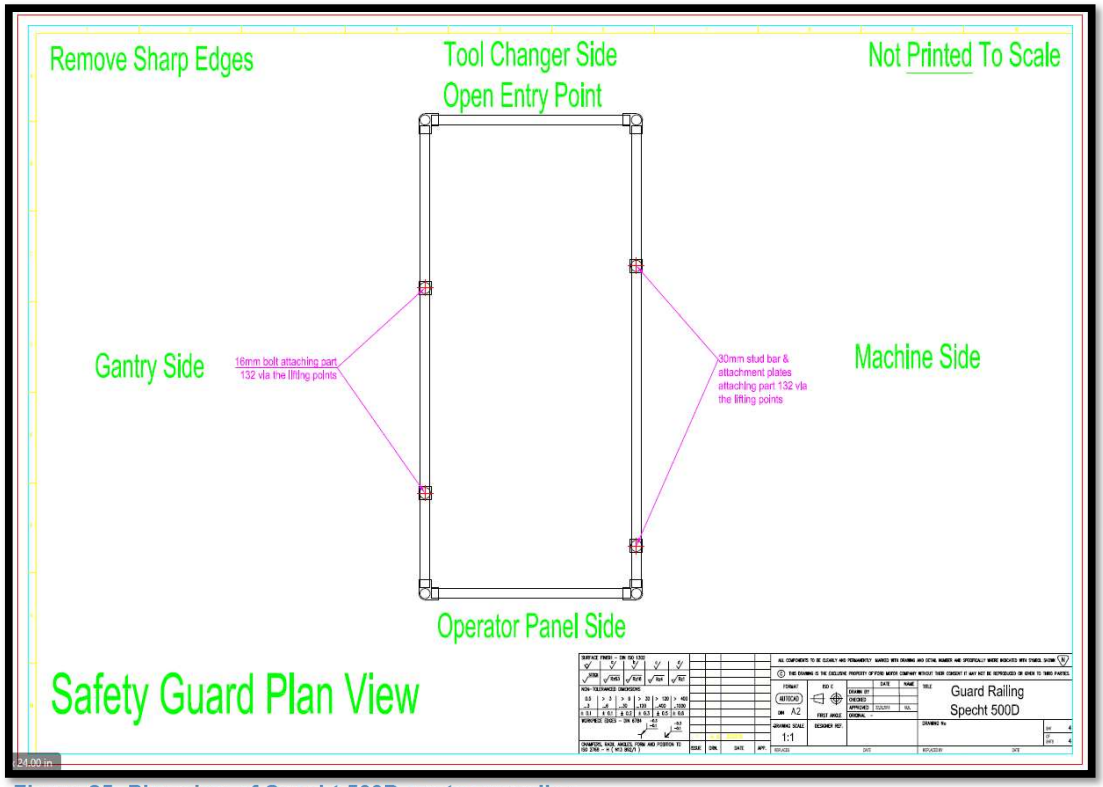


Figure 25: Plan view of Specht 500D gantry guarding.

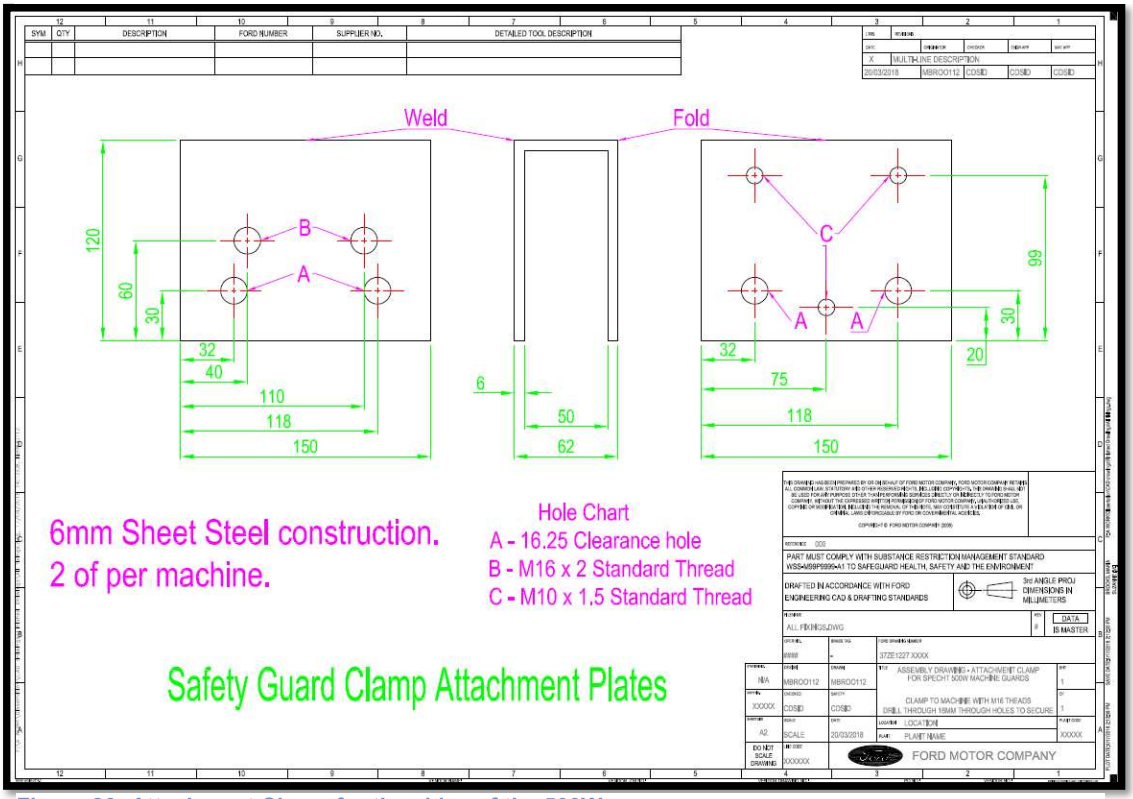


Figure 26: Attachment Clamp for the sides of the 500W

8.3.2 Specht 500W CNC

These machines are in design very similar to the 500Ds the major difference is the tool magazine. The 500Ds have a chain magazine that can be removed and maintained from the floor. In order for a tool change to take place there is a tool changer that can grab a tool from the magazine and swap it with the one that is in the spindle. The 500W machines have tools stored in a large magazine wheel. In order to change tools, the spindle must align with the magazine, which rotates so that the correct tool is accessible and the spindle picks it up from the magazine itself. This difference in tool changing means that the maintenance must be performed in a different way. In order to remove the magazine wheel a crane must be used to take the weight of it while it is detached and it is then removed and replaced through the top of the machine. It is for this reason that the guarding construction must have lower sides to enable a crane and the magazine to get in and out. Due to safety considerations the topple heights of the rails will be adhered to but the high sides like those of the 500D will be removed.

The 500W has M30 lifting points in the same locations as the 500D but there are no lifting points on the gantry side and no obvious points of connection. In order to overcome this issue several ideas were drawn up but the idea to clamp onto the sides of the machine was settled on. This clamping mechanism was made up by the in-plant tin smiths to the diagram shown in Figure 26. This clamping mechanism has the added advantage of being able to be placed in slightly different locations depending on small differences in the setup of the various 500W machines.

Designs were made up with the above considerations and can be seen in Figures 27-30.

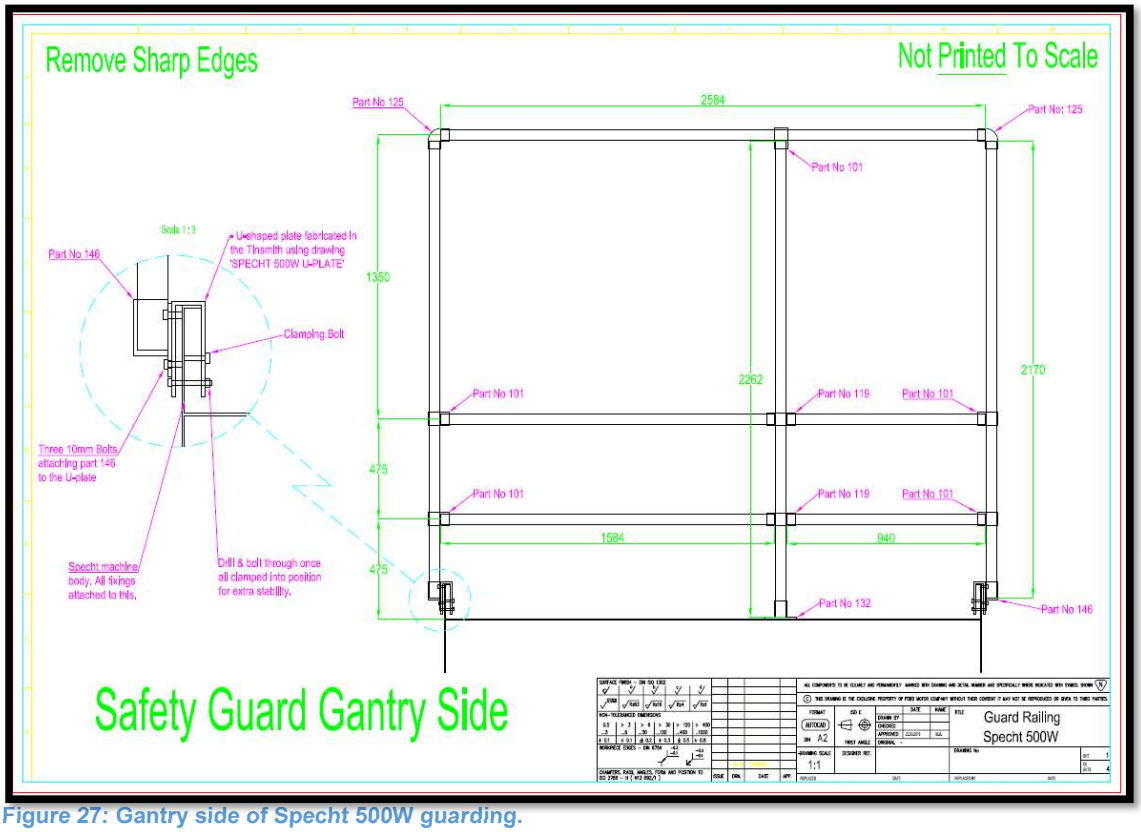


Figure 27: Gantry side of Specht 500W guarding.

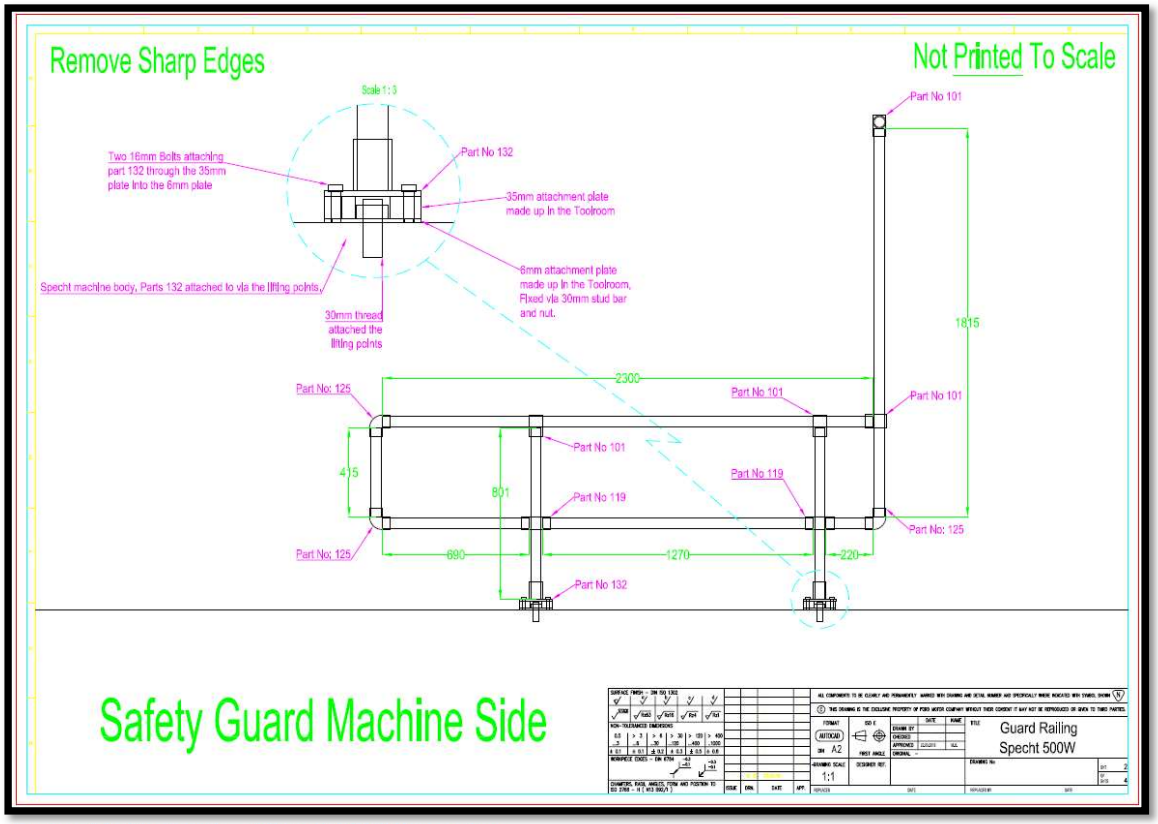


Figure 28: Back side of Specht 500W guarding.

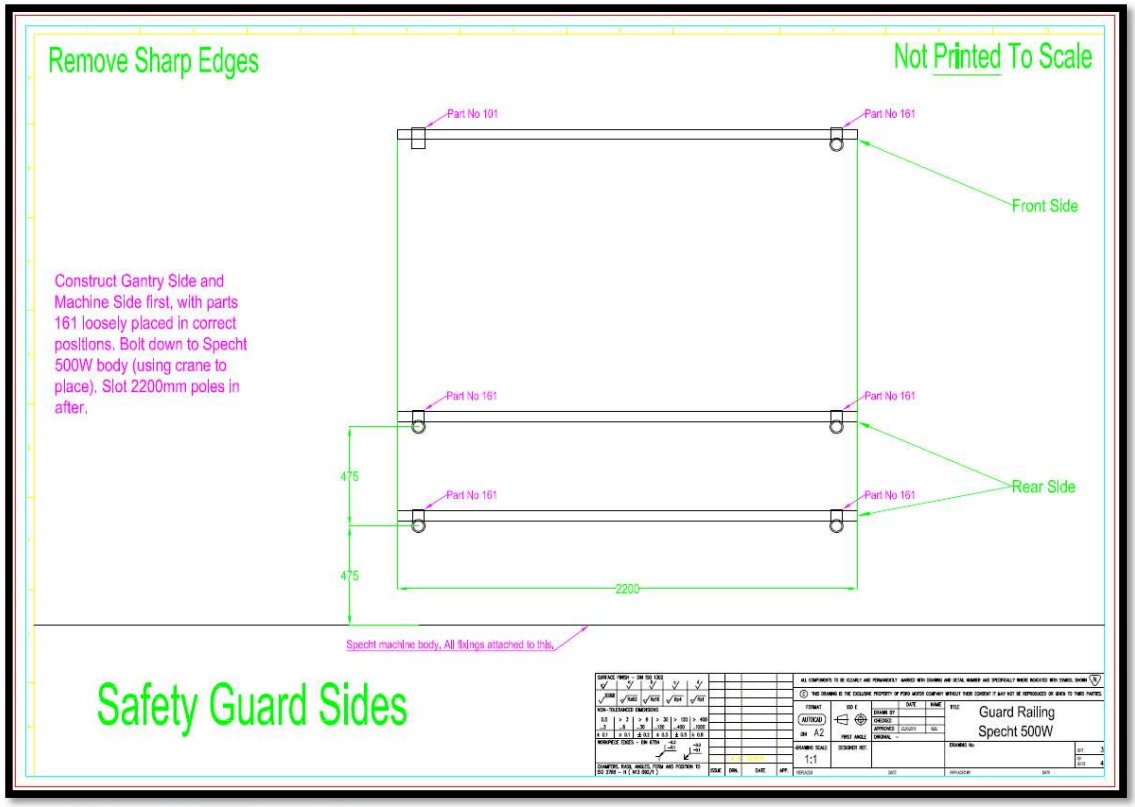


Figure 29: Specht 500W guard sides.

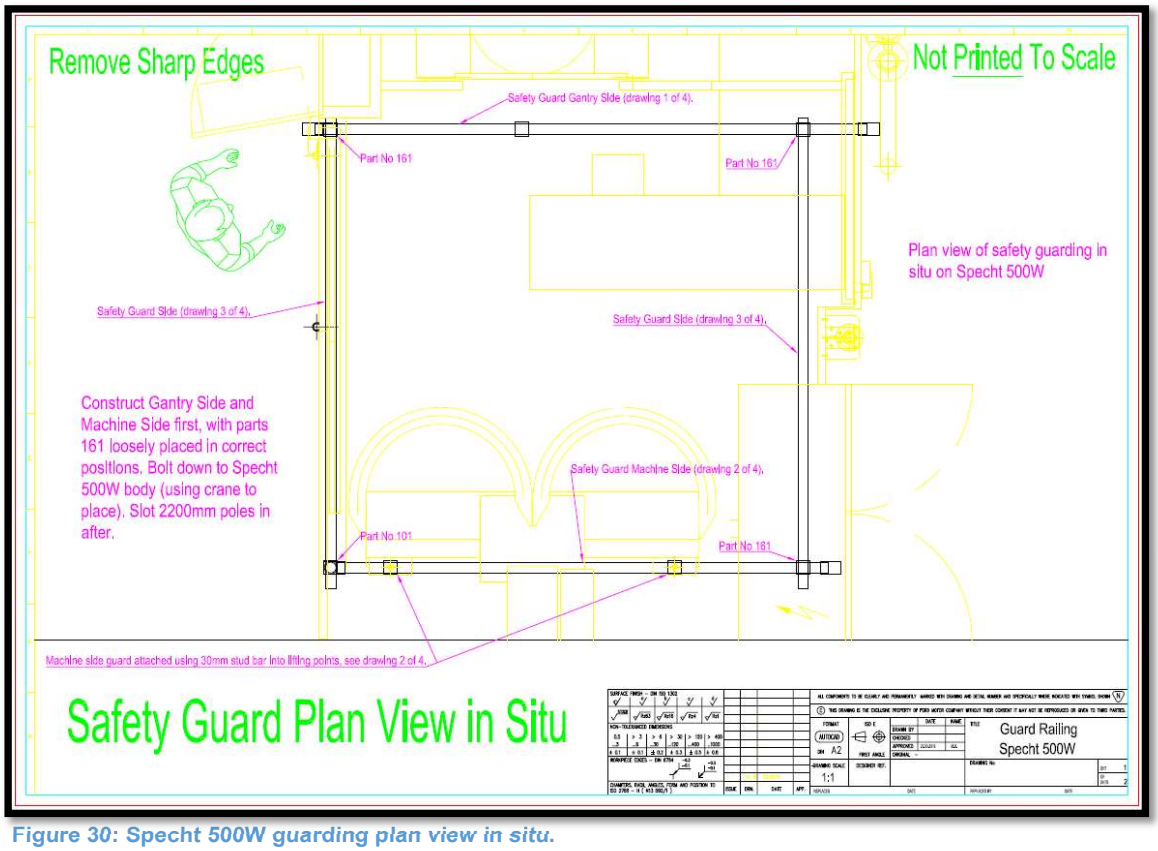


Figure 30: Specht 500W guarding plan view in situ.

8.3.3 Access

While the designs for the Specht guarding were being drawn up, a local access platform making company was tasked with designing a platform that could be used to gain access to the tops of the machines. Specifications included:

- Maximum width of 850mm (in order to fit between all machines)
- Must be able to fold/reduce to 2700mm in overall height in order to be able to move under gantries and overhead pipes.
- Platform should be able to reach a height of 2700 in order to gain access to all machines.
- Stabilising feet should be included so that the platform is stable when fully extended.
- Some variety of 'wedging' should be included so that in narrow spaces the platform can be stabilised without the use of the feet.
- Platform should be accessed from both ends so that it can be compatible with any machine.

The platform has been delayed in design and several revisions have been made. Figure 31 shows the final design. As of 13/04/18 this platform had just been approved by Fords buyer in Romania. This platform has a lead-time of 8 weeks and is due for completion around 14/06/18.

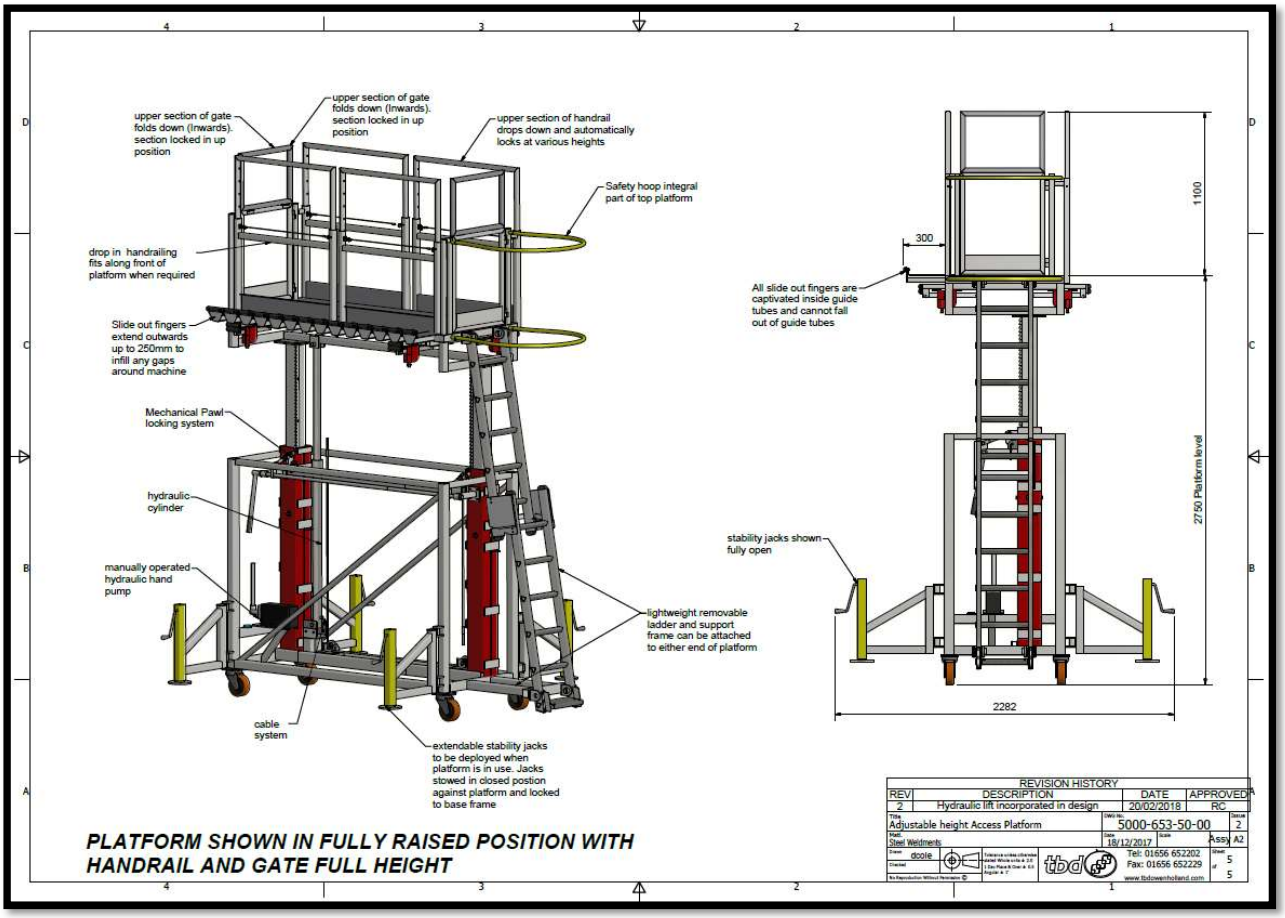


Figure 31: Access platform, further drawings in Appendix 13

8.4 FMEA

With the guarding and platform designed but not yet constructed a failure mode and effects analysis (FMEA) was carried out. This document is designed to help identify all possible failures that could occur to the guarding and access platform during use. The various causes of these failures were identified along with current controls to prevent the failure or minimise the risks associated with them. Each failure mode is rated from one to ten by the severity (SEV) likelihood of occurrence (OCC) and detection (DET). A rating of one being the best outcome, low severity, unlikely to occur and easily detected, a rating of ten would be the worst outcome with a failure being severe, very likely to occur and very unlikely to be detected. These SEV, OCC and DET values are multiplied together to give an overall risk priority number (RPN). Using the RPN number failure modes and preventing them can be prioritised. It is worth noting that a severity rating of ten should be dealt with first because of the huge negative impact on customers if it was to occur, this is even if the overall RPN of the failure mode is low (George, 2005). Copies of the initial FMEA charts for the guarding and the access platform can be seen in Figures 32 and 33.

FAILURE MODE AND EFFECTS ANALYSIS

Item: Specht Guarding
Model: 500W 500D
Prepared by: Maria Brooks
Core Team: Jonathan Richards (MOS Manager), Dan Clark (MMS) & Maria Brooks (ECS)
FMEA number: 1
Page : 1
FMEA Date (Orig): 05-04-18

Process Function	Potential Failure Mode	Potential Effect(s) of Failure	Sev	Δ	Potential Cause(s)/ Mechanism(s) of Failure	Occ	Current Process Controls	Det	RPN	Recommended Action(s)	Responsibility and Target Completion Date	Action Results				
												Actions Taken	Sev	Occ	Det	RPN
Support Frame	Loose grub screws	Movement of support bars	7	o	Vibration	6	Tightened with torque wrench to required 40Nm.	3	126	Sceduled mainteance (SMS) every 3 months. Check torque of the grub screws.	SMS dept to issue first SMS on 14th June 18 to be compleated by the PM team					
	Sheering of grub screws	Movement of support bars	7	o	Corrosion/stress/ overtightening	1	Tightened with torque wrench to required 40Nm	6	42	Sceduled mainteance (SMS) every 3 months. Check torque of the grub screws.	SMS dept to issue first SMS on 14th June 18 to be compleated by the PM team					
	Snapping/Fracture	Support bar detaches/ sudden movement	8	o	Corrosion	1	None	4	32	Sceduled mainteance (SMS) every 3 months. Check for damage/corrosion.	SMS dept to issue first SMS on 14th June 18 to be compleated by the PM team					
Gantry guard mesh	Loose fixings	Movement of mesh	4	o	Vibration	6	Tightened with torque wrench.	2	48	Sceduled mainteance (SMS) every 3 months. Check torque of the fixing screws.	SMS dept to issue first SMS on 14th June 18 to be compleated by the PM team					
	Snapping/Fracture mesh	Mesh detaches/ sudden movement	6	o	Corrosion	3	None	4	72	Scheduled maintenance (SMS) every 3 months. Check for damage/corrosion.	SMS dept to issue first SMS on 14th June 18 to be completed by the PM team					
	Snapping/Fracture fixings	Mesh detaches/ sudden movement	6	o	Corrosion/stress/over tightening	3	Tightened with torque wrench.	5	90	Scheduled maintenance (SMS) every 3 months. Check for damage/corrosion.	SMS dept to issue first SMS on 14th June 18 to be completed by the PM team					

Figure 32: Initial FMEA of Specht CNC guarding.

FAILURE MODE AND EFFECTS ANALYSIS

Item: Access Platform | FMEA number: 1
Model: TBD | Prepared by: Maria Brooks | Page : 1
Core Team: Jonathan Richards (MOS Manager), Dan Clark (MMS) & Maria Brooks (ECS) | FMEA Date (Orig): 05-04-18

Process Function	Potential Failure Mode	Potential Effect(s) of Failure	Sev	Δ	Potential Cause(s)/ Mechanism(s) of Failure	Occ	Current Process Controls	Det	RPN	Recommended Action(s)	Responsibility and Target Completion Date	Action Results				
												Actions Taken	Sev	Occ	Det	RPN
Access Platform support frame	Bolts Sheering	Movement of support bars	7	o	Corrosion/stress	1	None	6	42	Sceduled mainteance (SMS) every 6 months. Check for damage/corrosion & functionality.	SMS dept to issue first SMS on 14th June 18 to be compleated by the PM team					
	Snapping/Fracture	Support bar detaches/ sudden movement	8	o	Corrosion	1	None	4	32	Scheduled maintenance (SMS) every 6 months. Check for damage/corrosion & functionality.	SMS dept to issue first SMS on 14th June 18 to be completed by the PM team					
	Slide out fingers Jammed/damaged	Gaps around machine not filled	5	o	Corrosion/stress	3	Basic checks carried out by maintenance at every use.	1	15	Scheduled maintenance (SMS) every 6 months. Check for damage/corrosion & functionality.	SMS dept to issue first SMS on 14th June 18 to be completed by the PM team					
Adjustable Height on Platform	Hydraulic leak/low pressure	Unable to pump to the required height	9	x	Corrosion/stress/ oil not topped up	5	Basic checks carried out by maintenance at every use.	1	45	Scheduled maintenance (SMS) every 6 months. Check for damage/corrosion & functionality.	SMS dept to issue first SMS on 14th June 18 to be completed by the PM team					
		Platform wants to drop.	7	o	Corrosion/stress/ oil not topped up	4	Mechanical Pawl lock.	2	56	Scheduled maintenance (SMS) every 6 months. Check for damage/corrosion & functionality.	SMS dept to issue first SMS on 14th June 18 to be completed by the PM team					
	Mechanical Pawl Jammed/damaged	unable to lock the platform in place	8	o	Pawl jammed out Corrosion/stress	2	Basic checks carried out by maintenance at every use.	2	32	Scheduled maintenance (SMS) every 6 months. Check for damage/corrosion & functionality.	SMS dept to issue first SMS on 14th June 18 to be completed by the PM team					
		Platform cannot be lowered/raised	7	o	Pawl jammed in Corrosion/stress	2	Basic checks carried out by maintenance at every use.	2	28	Scheduled maintenance (SMS) every 6 months. Check for damage/corrosion & functionality.	SMS dept to issue first SMS on 14th June 18 to be completed by the PM team					
Stability of platform	Jammed/ damaged stability jacks	In open spaces the platform has no/poor stability	8	o	Corrosion/stress	2	Basic checks carried out by maintenance at every use.	1	8	Scheduled maintenance (SMS) every 6 months. Check for damage/corrosion & functionality.	SMS dept to issue first SMS on 14th June 18 to be completed by the PM team					
	Snapping/Fracture to the stability jacks	In open spaces the platform has no/poor stability	8	o	Corrosion/stress	2	Basic checks carried out by maintenance at every use.	1	8	Scheduled maintenance (SMS) every 6 months. Check for damage/corrosion & functionality.	SMS dept to issue first SMS on 14th June 18 to be completed by the PM team					
	Platform not level	Platform unstable	8	o	Ground not level	5	Bulls-eye level gauge.	1	40	Scheduled maintenance (SMS) every 6 months. Check for functionality of bulls eye	SMS dept to issue first SMS on 14th June 18 to be completed by the PM team					
		Platform unstable	8	o	Jacks/wheels not level	2	Bulls-eye level gauge.	1	16	Scheduled maintenance (SMS) every 6 months. Check for damage/corrosion & functionality.	SMS dept to issue first SMS on 14th June 18 to be completed by the PM team					

Figure 33: Initial FMEA of access platform

In order to address the various failure modes of both the machine guarding and the access platform, it was decided that SMS would be the best and most reliable way of checking and fixing any issues that arose with this new equipment. An SMS every three months was decided upon for the guarding as the RPN were of a higher average than the access platform. Six months was decided upon for the access platform. The SMS is currently scheduled to start mid-June when more guards will be erected and the access platform is delivered. The SMS is written to include maintenance activities that address each of the failure modes as highlighted by the FMEA (draft copies are shown in Figures 34 and 35). It is worth noting that although three and six months is the initial scheduling of the SMS this can be lengthened and shortened depending on the amount of preventative maintenance that is carried out during these checks. With the implementation of the SMS the RPN scores were re-evaluated on the FMEA charts. The improvement in the risks associated with the equipment can clearly be seen in Figures 36 and 37.

Ford Motor Company

T.E.M.

REQUEST TO ADD PREVENTIVE MAINTENANCE TO T.E.M.

Please complete all shaded areas and send to T.E.M Administrator:

EQUIPMENT COST CENTRE: 6810 OP NO.: CNC's BT NO.:

AREA PAG BLOCK MACHINING

FREQUENCY 90 (DAYS) **START DATE** 14.06.18

TRADE SKILLED **DURATION** 1 (HOURS)

WORK TYPE* ☒ SAFETY ☐ PREVENTIVE ☐ PREDICTIVE ☐ BEW ☐ QUALITY

*TICK ONE

CAN THIS JOB BE COMPLETED WHILE PRODUCTION IS RUNNING? NO

JOB DESCRIPTION:

Check all fixing grub screws are tight to 40Nm (10mm allan)
Inspect frame for damage or corrosion.
Inspect mesh for damage or corrosion.
Insure mesh fixings are tight.
Check fixing points to the machine for damage and corrosion
Ensure fixing bolts are tight to 70Nm

REQUESTED BY: Maria S Brooks **DATE:** 15/04/2018

RETURNED BY: _____ **DATE:** _____

PM MASTER: _____

COMMENTS:

_____

_____

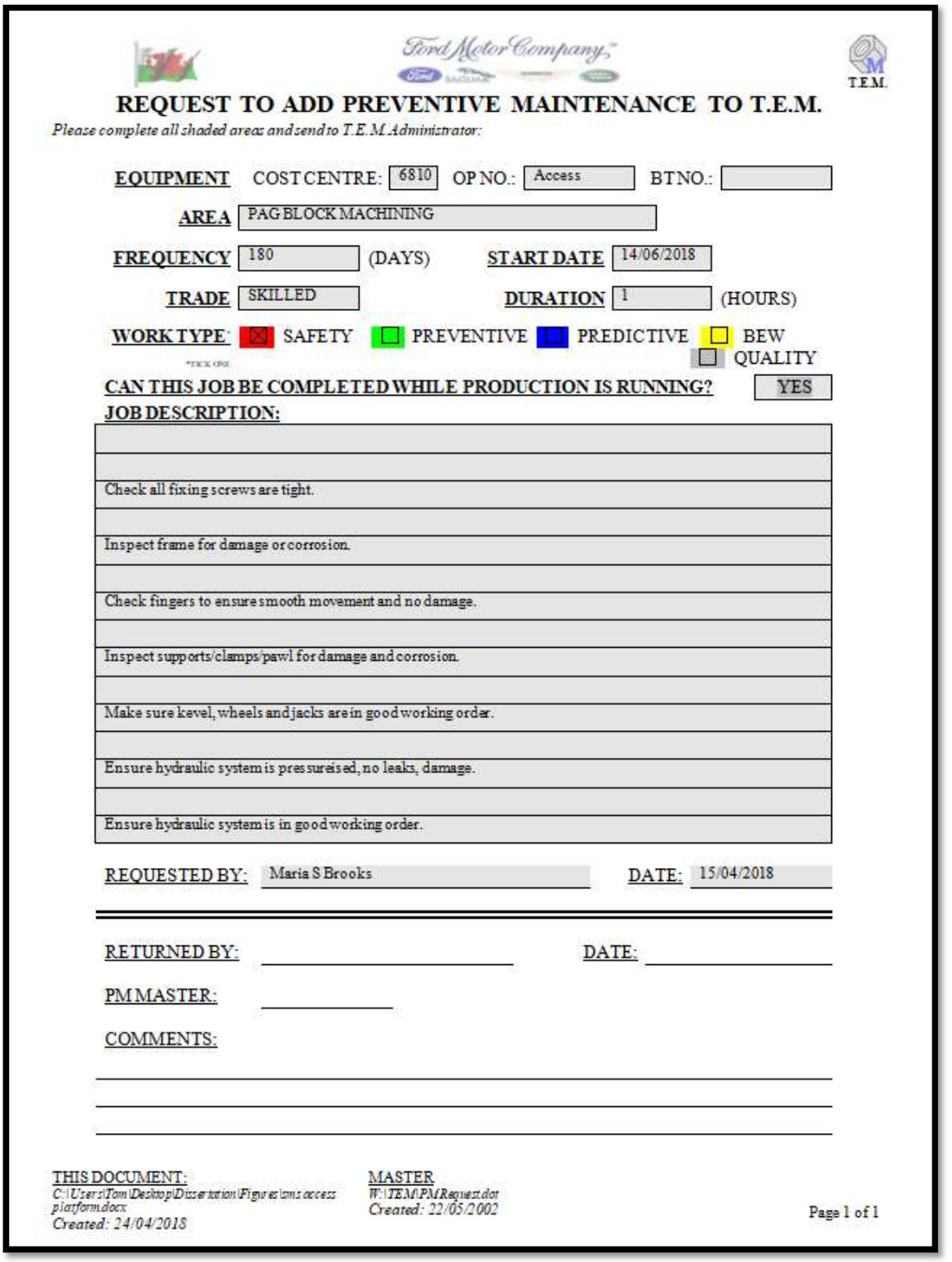
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Created: 24/04/2018

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Created: 22/05/2002

Page 1 of 1

Figure 34: Draft SMS for the CNC guarding.



Ford Motor Company

T.E.M.

REQUEST TO ADD PREVENTIVE MAINTENANCE TO T.E.M.

Please complete all shaded areas and send to T.E.M Administrator:

EQUIPMENT COST CENTRE: 6810 OP NO.: Access BT NO.:

AREA PAG BLOCK MACHINING

FREQUENCY 180 (DAYS) **START DATE** 14/06/2018

TRADE SKILLED **DURATION** 1 (HOURS)

WORK TYPE *TICK ONE ☒ SAFETY ☐ PREVENTIVE ☐ PREDICTIVE ☐ BEW ☐ QUALITY

CAN THIS JOB BE COMPLETED WHILE PRODUCTION IS RUNNING? YES

JOB DESCRIPTION:

Check all fixing screws are tight.
Inspect frame for damage or corrosion.
Check fingers to ensure smooth movement and no damage.
Inspect supports/clamps/pawl for damage and corrosion.
Make sure kevel, wheels and jacks are in good working order.
Ensure hydraulic system is pressureised, no leaks, damage.
Ensure hydraulic system is in good working order.

REQUESTED BY: Maria S Brooks **DATE:** 15/04/2018

RETURNED BY: _____ **DATE:** _____

PM MASTER: _____

COMMENTS:

_____

_____

_____

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Created: 24/04/2018

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Created: 22/05/2002

Page 1 of 1

Figure 35: Draft SMS for the new access platform.

FAILURE MODE AND EFFECTS ANALYSIS

Item: Specht Guarding
Model: 500W 500D
Prepared by: Maria Brooks
Core Team: Jonathan Richards (MOS Manager), Dan Clark (MMS) & Maria Brooks (ECS)
FMEA number: 1
Page : 1
FMEA Date (Orig): 05-04-18

Process Function	Potential Failure Mode	Potential Effect(s) of Failure	Sev	Δ	Potential Cause(s)/ Mechanism(s) of Failure	Occur	Current Process Controls	Detec	RPN	Recommended Action(s)	Responsibility and Target Completion Date	Action Results				
												Actions Taken	Sev	Occ	Det	RPN
Support Frame	Loose grub screws	Movement of support bars	7	o	Vibration	6	Tightened with torque wrench to required 40Nm	3	126	Scheduled maintenance (SMS) every 3 months. Check torque of the grub screws.	SMS dept to issue first SMS on 14th June 18 to be completed by the PM team	Regular checks.	7	4	1	28
	Sheering of grub screws	Movement of support bars	7	o	Corrosion/stress/ over tightening	1	Tightened with torque wrench to required 40Nm	6	42	Scheduled maintenance (SMS) every 3 months. Check torque of the grub screws.	SMS dept to issue first SMS on 14th June 18 to be completed by the PM team	Regular checks.	7	1	4	28
	Snapping/Fracture	Support bar detaches/ sudden movement	8	o	Corrosion	1	None	4	32	Scheduled maintenance (SMS) every 3 months. Check for damage/corrosion.	SMS dept to issue first SMS on 14th June 18 to be completed by the PM team	Regular checks.	8	1	2	16
Gantry guard mesh	Loose fixings	Movement of mesh	4	o	Vibration	6	Tightened with torque wrench.	2	48	Scheduled maintenance (SMS) every 3 months. Check torque of the fixing screws.	SMS dept to issue first SMS on 14th June 18 to be completed by the PM team	Regular checks.	4	4	1	16
	Snapping/Fracture mesh	Mesh detaches/ sudden movement	6	o	Corrosion	3	None	4	72	Scheduled maintenance (SMS) every 3 months. Check for damage/corrosion.	SMS dept to issue first SMS on 14th June 18 to be completed by the PM team	Regular checks.	6	2	2	24
	Snapping/Fracture fixings	Mesh detaches/ sudden movement	6	o	Corrosion/stress/over tightening	3	Tightened with torque wrench.	5	90	Scheduled maintenance (SMS) every 3 months. Check for damage/corrosion.	SMS dept to issue first SMS on 14th June 18 to be completed by the PM team	Regular checks.	6	1	4	24

Figure 36: FMEA of the Specht guarding showing the action results with implementation of the SMS.

FAILURE MODE AND EFFECTS ANALYSIS

Item: Access Platform
Model: TBD
Prepared by: Maria Brooks
Core Team: Jonathan Richards (MOS Manager), Dan Clark (MMS) & Maria Brooks (ECS)
FMEA number: 1
Page : 1
FMEA Date (Orig): 05-04-18

Process Function	Potential Failure Mode	Potential Effect(s) of Failure	Sev	Δ	Potential Cause(s)/ Mechanism(s) of Failure	Occ	Current Process Controls	Det	RPN	Recommended Action(s)	Responsibility and Target Completion Date	Action Results				
												Actions Taken	Sev	Occ	Det	RPN
Access Platform support frame	Bolts Sheering	Movement of support bars	7	o	Corrosion/stress	1	None	6	42	Sceduled mainteance (SMS) every 6 months. Check for damage/corrosion & functionality.	SMS dept to issue first SMS on 14th June 18 to be compleated by the PM team	Regular checks and functionality tests.	7	1	2	14
	Snapping/Fracture	Support bar detaches/ sudden movement	8	o	Corrosion	1	None	4	32	Sceduled mainteance (SMS) every 6 months. Check for damage/corrosion & functionality.	SMS dept to issue first SMS on 14th June 18 to be compleated by the PM team	Regular checks and functionality tests.	8	1	2	16
	Slide out fingers Jamed/damaged	Gaps around machine not infilled	5	o	Corrosion/stress	3	Basic checks carried out by maintenance at every use.	1	15	Sceduled mainteance (SMS) every 6 months. Check for damage/corrosion & functionality.	SMS dept to issue first SMS on 14th June 18 to be compleated by the PM team	Regular checks and functionality tests.	5	1	1	5
Adjustable Height on Platform	Hydraulic leak/low pressure	Unable to pump to the required height	9	x	Corrosion/stress/ oil not topped up	5	Basic checks carried out by maintenance at every use.	1	45	Scheduled maintenance (SMS) every 6 months. Check for damage/corrosion & functionality.	SMS dept to issue first SMS on 14th June 18 to be completed by the PM team	Regular checks and functionality tests.	9	2	1	18
		Platform wants to drop.	7	o	Corrosion/stress/ oil not topped up	4	Mechanical Pawl lock.	2	56	Scheduled maintenance (SMS) every 6 months. Check for damage/corrosion & functionality.	SMS dept to issue first SMS on 14th June 18 to be completed by the PM team	Regular checks and functionality tests.	7	1	1	7
	Mechanical Pawl Jammed/damaged	unable to lock the platform in place	8	o	Pawl jammed out Corrosion/stress	2	Basic checks carried out by maintenance at every use.	2	32	Scheduled maintenance (SMS) every 6 months. Check for damage/corrosion & functionality.	SMS dept to issue first SMS on 14th June 18 to be completed by the PM team	Regular checks and functionality tests.	8	1	1	8
		Platform cannot be lowered/raised	7	o	Pawl jammed in Corrosion/stress	2	Basic checks carried out by maintenance at every use.	2	28	Scheduled maintenance (SMS) every 6 months. Check for damage/corrosion & functionality.	SMS dept to issue first SMS on 14th June 18 to be completed by the PM team	Regular checks and functionality tests.	7	1	1	7
Stability of platform	Jammed/ damaged stability jacks	In open spaces the platform has no/poor stability	8	o	Corrosion/stress	2	Basic checks carried out by maintenance at every use.	1	8	Scheduled maintenance (SMS) every 6 months. Check for damage/corrosion & functionality.	SMS dept to issue first SMS on 14th June 18 to be completed by the PM team	Regular checks and functionality tests.	8	1	1	8
	Snapping/Fracture to the stability jacks	In open spaces the platform has no/poor stability	8	o	Corrosion/stress	2	Basic checks carried out by maintenance at every use.	1	8	Scheduled maintenance (SMS) every 6 months. Check for damage/corrosion & functionality.	SMS dept to issue first SMS on 14th June 18 to be completed by the PM team	Regular checks and functionality tests.	8	1	1	8
	Platform not level	Platform unstable	8	o	Ground not level	5	Bulls-eye level gauge.	1	40	Scheduled maintenance (SMS) every 6 months. Check for functionality of bulls eye	SMS dept to issue first SMS on 14th June 18 to be completed by the PM team	Regular checks and functionality tests.	8	3	1	24
		Platform unstable	8	o	Jacks/wheels not level	2	Bulls-eye level gauge.	1	16	Scheduled maintenance (SMS) every 6 months. Check for damage/corrosion & functionality.	SMS dept to issue first SMS on 14th June 18 to be completed by the PM team	Regular checks and functionality tests.	8	1	1	8

Figure 37: FMEA of the access platform showing the action results with implementation of SMS.

8.5 Implementation

In order to roll out the construction guarding prototypes were built first. With the considerations that were taken into account during the design phase it is unlikely that any major adjustments would be needed, only minor. In order to get each machine fitted with a guard rail the team decided that it was best to go with an organic approach, fitting guards to suit the changing conditions of the line. First and foremost, guards would be fitted so that the PM team could carry out their work. If a gantry was down for another reason guards would be fitted to as many machines in that cell as possible during the downtime. And lastly priority would be given to any machines that would imminently need scaffolding erected.
The full roll out of this project is on hold until the access platform is delivered. Until then guarding parts are on order and are being cut and partially assembled at floor level.

8.6 Break Even Analysis

As mentioned in appendix 2 there are some key values that finance was unable to obtain for the behalf of costing within this project. It is for this reason that some calculations will be left simplistic.
Within the problem statement the value shown of £11,000,000 relates to lost throughput, because of the preventative maintenance that is being implemented alongside this project and the cause and effect analysis showing that poor maintenance is the cause of the currently needed scaffolding, it is the feeling of this author that relating any increased throughput solely to the implementation of the scaffolding is redundant. For a more meaningful break even analysis the costs of current scaffolding will be compared to the new permanent guarding.

8.6.1 Project Cost

Total cost of the new guarding is equating to £500 per machine. There are 32 Specht CNC machines that would need this guarding installed.

$$550 \text{ X } 32 = £17{,}600$$

Platform cost has been quoted at £22,000 (Finance Dept, 2018).
It is estimated that each machine will take an average of 30 minutes of gantry shutdown time to erect.

$$[32\ X\ 1800](shutdown\ time/s) \div 252(cycle\ time/s) = 229\ (parts\ lost)$$

As the erection of these new guards will be done over a period of two months, it can be said that an estimated 29 parts per week will be lost as a direct result of shutdown time due to the new guarding. This equates to a lost throughput cost of £8113.33 per week.

$$29\ \times 279.77\ (cost\ per\ part\ Appendix\ 2) = £8113.33$$

8.6.2 Current Cost of Scaffolding

As shown in Table 3, the shutdown time due to scaffolding erection and removal totalled a minimum of 31 hours, 50 minutes and 30 seconds aka 114,630 seconds of shutdown time.

$$114630(shutdown\ time/s)\ \div 252(cycle\ time/s) = 455\ (parts\ lost)$$

As the shutdown time monitored was over a period of 13 weeks, it can be said that 35 parts per week were lost as a direct result of scaffolding shutdown time. This equates to a lost throughput cost of £9791.95 per week.

$$35\ \times 279.77\ (cost\ per\ part\ Appendix\ 2) = £9791.95$$

It was shown that a minimum of 13 instances of scaffolding erection were documented over that same period, an average of one erection at a cost of £740 per week.

8.6.3 Break Even Time

Using the values from the previous two sections a break even time for this project can be calculated as shown below:

$$Break\ Even\ Time\ (weeks) = \frac{Total\ project\ cost\ (£)}{Cost\ of\ scaffolding\ (\frac{£}{week})}$$

$$Break\ Even\ Time\ (weeks) = \frac{17{,}600 + 22{,}000 + \ 8113.33\ (£)}{9791.95 + 740\ (£)}$$

$$Break\ Even\ Time\ (weeks) = \frac{47{,}713.33\ (£)}{10{,}531.95\ (£)}$$

$$Break\ Even\ Time = \ 4.53\ Weeks$$

Even with the apparently large cost of this project of nearly £50,000 it is clear that this project is worth the effort as it will pay for itself in just over a month.

9.0 Control

9.1 Timing Plan

Due to the large number of constraints on the line the author was transferred to another department, the resource team. This team's purpose is to help address labour shortages and assist in breakdown maintenance. As the main driver of this project the author is unable to continue working on the guarding when she is used as resource. Supervisors have given the odd half shift to continue on with the project implementation but unfortunately this has not been enough time to stay on track with the initial timing. It is for this reason in main, along with some issues with the shipping of parts for the trial guards, that the project is behind schedule. The current progress is shown in figure 38 below.

Task	Start Date	Duration	Percentage Compleate
Identify Project	18.09.17	7	100%
Team formation	25.09.17	1	100%
Project meetings	25.09.17	1	100%
litriture review	25.09.17	14	100%
Scope of the project	25.09.17	7	100%
Overall problem statement	02.10.17	7	100%
Identify quality characteristics	09.10.17	7	100%
Identify VOC	09.10.17	7	100%
Aims and objectives	16.10.17	7	100%
Write up project charter	23.10.17	7	100%
Data collection plan	30.10.17	7	100%
Collect baseline data	06.11.17	7	100%
Perato diagram of stoppage modes	13.11.17	7	100%
Cause and effect, main stoppage mode	20.11.17	7	100%
Posmon data of shutdown modes	27.11.17	7	100%
Determine main causes	04.12.17	7	100%
Prioritise root causes	11.12.17	7	100%
Identify main root cause	18.12.17	7	100%
Review current process	01.01.18	7	100%
Brainstorm potential solutions	08.01.18	3	100%
Select and prioritise solutions	11.01.18	4	100%
Design solution	15.01.18	28	100%
Cost analysis & order trail parts	22.01.18	7	100%
Trial solution	05.02.18	14	100%
Adjust solution if needed	19.02.18	7	100%
Trial solution again	26.02.18	14	75%
FMEA	12.03.18	7	100%
Consider any maintenance on new system	19.03.18	7	100%
Risk assessment	26.03.18	7	0%
Brainstorm line roll out plans	26.03.18	1	100%
Select and prioritise plan	26.03.18	1	100%
Cost and impact - break even analysis	02.04.18	6	100%
Order parts	09.04.18	21	30%
Roll out solution to whole line	16.04.18	56	10%
Control charts	16.04.18	7	0%
Implement process controls	16.04.18	7	0%
Ensure all personnel have training	16.04.18	14	0%
Monitor usage and address any issues that occur	16.04.18	365	0%

Figure 38: Timing plan - current

9.2 Management of change

Within Bridgend Ford Engine Plant there is an endemic problem with resistance to change. The new guarding falls into this category, previously we used scaffolding that was regularly inspected and all users knew it to be a safe method of gaining access to the top of a machine. With the new guarding it can be predicted that there will be at least some resistance to its use as someone will see it as 'unsafe' in comparison to the scaffolding. It is common for this problem to occur especially in new systems that rely heavily on safety, there have been times where employees have refused to use a new system because of a perceived safety hazard that was in reality risk assessed and dealt with in a sensible safe manner.

One of the problems that has led to this resistance to new ideas is that employees are rarely informed of any new systems in their area, until the last minute, and there is often a feeling of distrust and resentment when they are introduced. This can be attributed to poor management of change. The proven method of Unfreeze, Change, Freeze (Lewin, 1947) is not always followed, the unfreeze section can often be completely missed. This makes any change more daunting and sudden to employees and many forces still exist that oppose change. The most common tactic to help deal with this is coercion within the factory. Coercion is a valid method of overcoming resistance but should be used as a last resort and not as the standard go to tactic (Daft, 2010).

It is also advantageous to involve employees in decisions that will ultimately affect them. Not only will there be a more diverse skill-base on side which could lead to faster/better problem solving but it also helps the unfreeze section of Lewin's model to take effect. Daft et al [2010] states:

"Research studies have shown that proactively engaging front-line employees in upfront planning and decision making about changes that affect their work results in much smoother implementation. Participation also helps managers determine potential problems and understand the differences in perceptions of change among employees." [Daft et al, 2010, P295]

Knowing the problems that face this project when if it fully implemented it would be pertinent to begin the unfreeze phase now. Throughout this project the author has discussed various ideas and problems with members of the block maintenance team. This should help to unfreeze as discussions about safety as well as other issues have already been brought up.

In order to help avoid any persistent resistance to the new guarding it is important that maintenance is involved in discussions about SMS prior to finalisation, and the outcomes of risk assessments. Although there is unlikely to be much changed, the morale of maintenance personnel is less likely to drop as a result of this change if they feel that they were directly asked for input on the safety side of things.

9.3 SMS

With all systems in place the largest area for monitoring will be that of the SMS. There already exist systems that control the issuing of SMS to the required areas and a control system to mark off when SMS is completed. SMS is escalated in priority the longer it is ignored; this means that if one is not completed it will be questioned in the managerial morning meetings; this is a good method to ensure that they are not overlooked.

9.4 Metrics

With the guarding fully implemented, POSMON should definitely show improvement in the shutdown time of gantries. It is predicted that shutdown due to scaffolding will drop to next to nothing. There will of course be the occasional anomaly such as scaffolding put up around the gantry or building structure but this is a very rare occurrence.

10.0 Conclusion and Recommendations

In conclusion low production scores are attributed in main to gantry downtime and within this the "waiting attention" downtime. Although this project did not focus on this problem, clearly a great deal could be done from a management perspective to help reduce this issue. We could extrapolate that the main causes of all downtime, including on the washes and CNCs, on PAG block machining could be down to this "waiting attention" problem. It would be pertinent to look to solve this problem in a timely manner as it is clear that production scores would greatly improve if addressed.

This project looks at the next biggest problem; that of shutdown time of the gantries. In order to fully understand and deal with this problem the DMAIC methodology was used. This approach is one that has been adapted and improved from older methodologies into the framework that is used within Six Sigma today.

The define stage, arguably the most important helps to work out the main details of the problem, where it is, what the processes are, the deliverables and the voice of the customer. Here it was discovered that the main issue was a basic requirement, the line was unable to meet production targets and therefore had to buy in pre-machined parts to satisfy its customers.

The measure phase looked at the methods of data gathering. The main source of information here was POSMON, although flawed; a vast deal of useful information was gained this way. This data was augmented with information from interviews with people who work on the line, personal experience and the maintenance handover book. This enabled the author to gather enough information to be able to draw valid conclusions.

Analysing the data in the analyse phase of DMAIC took some time as POSMON provides so much it was complex to find the best way of presenting data to enable ease of visualisation. In the main Pareto charts were used as they best helped to focus in on the base problems.

Within the improve phase the majority of the groundwork has been completed. Although behind schedule it is the hope of the author that the full realisation of the project will come naturally once the access platform has been delivered.

Looking at the environment within PAG Block machining line it is clear that the management of this new system is paramount. Going forward meetings will be scheduled with maintenance to ensure a smooth working transition and to enable any worries or issues to be fully dealt with prior to full implementation.

When verified it is worth looking at other areas within Bridgend Engine Plant to see if this initiative could be of benefit elsewhere. The nearby PAG headline has many of the same

CNC machines as the Block line and although production issues are not as bad, they still have a fair amount of scaffolding. They are also getting a preventative maintenance team so this would obviously benefit the team as better access means better surveys and inspection. If funds are not readily released, then this could be done one machine at a time and the access platform could be shared amongst the two lines due to their proximity.
DMAIC has been used extensively within Ford but here an extra stage is added after control, this is replicate. Within replicate the question is asked, could other plants within Ford Motor Company benefit from the actions that have been taken in this project? This helps to improve the company as a whole and helps to keep costs down, instead of a DMAIC being carried out in each factory; theoretically it should only be examined once and made available to all Ford plants and processes worldwide.

11.0 References

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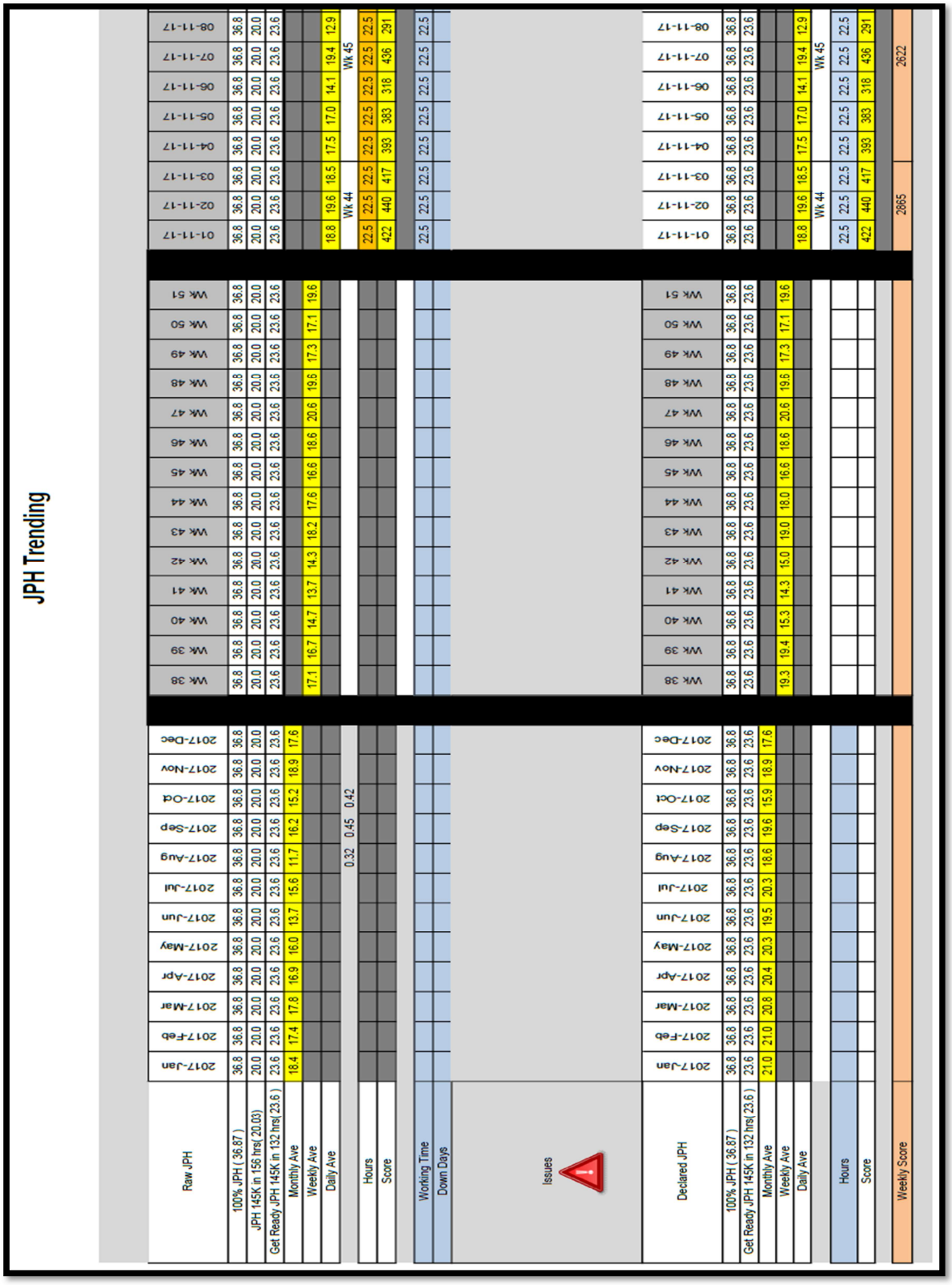
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12.0 Appendices

12.1 Appendix 1



12.2 Appendix 2

19.5 JPH, target 24 capable of 35.

$$24 - 19.5 = 4.5$$

4.5 JPH down per 24 hours of production.

$$4.5 \times 24 = 108$$

This equates to 108 parts down per day.

$$108 \times 365 = 39{,}420$$

This equates to 39,420 parts down per year (365 days).

The raw costing associated with a singular machined block was obtained through the finance department:

- Cast block = £172.18
- Added parts (blots, cam caps, valve seats etc) = £26.72
- Labour and overheads (services, building costs etc) = £80.87 (Finance Dept, 2018)

This gives a total cost of £279.77 per block to the company. This means that the lost throughput over the course of a year is as follows.

$$39{,}420 \times 279.77 = 11{,}028{,}533.40$$

This equals a loss of production of over £11,000,000 per year with no fines.

Unfortunately finance was unable to give the author access to the "sale price" of a machined block. This means that lost profit cannot be calculated only lost throughput.

12.3 Appendix 3

DIRECT HIRE & SCAFFOLDING LTD

28.9.17

For the attention of Mr. D. Preece
Ford Motor Co. – Bridgend
Quotation No. 172/17
Location: Various access

Further to your recent enquiry we confirm our quotation as detailed below:-

Supply, erect, hire and dismantle on completion
Various access and protection scaffolds projected usage September 2017

6 Access platform and protection handrail at various locations carried out in normal working hours 6 No. x £740.00 = £4,440.00

6 Access platform and protection handrail erected out of normal working hours 1 No. at £740.00 plus NPO at £144.00 = £884.00 each x 6 No. for month = £5,304.00

Total £9,744.00

VAT
Value added tax will be charged in addition to the above prices at the rate applicable at the time of invoicing.

TERMS AND CONDITIONS
Our quotation is open for acceptance for a period of 30 days and is subject to our mutual agreement on terms and conditions of contract and programme of works.

TERMS OF PAYMENT
Terms Nett.

We trust you find the above a fair and reasonable quotation and look forward to your valued reply in due course.

Yours faithfully
Lee Felstead
For and on behalf of

DIRECT HIRE & SCAFFOLDING LTD

CORRESPONDENCE ADDRESS
11 WOODBURY HILL
LOUGHTON
ESSEX
IG10 1JB

TEL 07836 343349

REGISTERED OFFICE ADDRESS
72 GREAT SUFFOLK STREET
LONDON
SE1 0BL

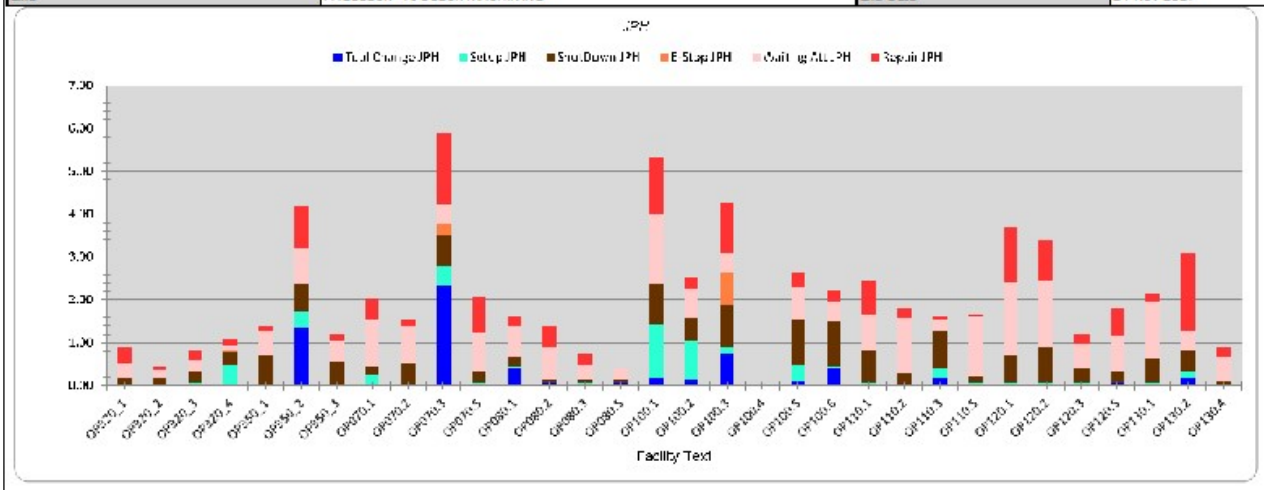
COMPANY REG NO: 10802841

12.4 Appendix 4

220 - DownTime By State Report

Selection Criteria

Area	AJ - AJ Engine Family		
Department	6810 - AJ CYL BLOCK MC		
Line	PAGBLOCK - AJ BLOCK MACHINING		
Cell	C320PAG-BL - OP320 MACHINESC350PAG-BL - OP350 MachinesC70PAG-BLK - OP70 MACHINESC80PAG-BLK - OP80 MACHINES C100PAG-BL - OP100 MACHINESC110PAG-BL - OP110 MACHINESC120PAG-BL - OP120 MACHINESC130PAG-BL - OP130 MACHINES C140PAG-BL - OP140 MACHINESC170PAG-BL - OP170 MACHINES		
Equipment	OP350.2 - AJ126 CNC MACHINEOP350.3 - AJ126 CNC MACHINEOP070.1 - SPECHT 500 MACHINEOP070.2 - SPECHT 500 MACHINEOP070.3 - SPECHT 500 MACHINE OP070.5 - SPECHT 500 MACHINEOP080.1 - SPECHT 500 MACHINEOP080.2 - SPECHT 500 MACHINEOP080.3 - SPECHT 500 MACHINEOP080.5 - SPECHT 500 MACHINE OP100.1 - SPECHT 600 MACHINEOP100.2 - SPECHT 600 MACHINEOP100.3 - SPECHT 600 MACHINEOP100.4 - SPECHT 600 MACHINEOP100.5 - SI6 SPECHT 600 MACHINE OP100.6 - SPECHT 500 MACHINEOP110.1 - SPECHT 500 MACHINEOP110.2 - SPECHT 500 MACHINEOP110.3 - SPECHT 500 MACHINE OP110.5 - SPECHT 500 MACHINEOP120.1 - SPECHT 500 MACHINEOP120.2 - AJ133 SPECHT 500W MACHINEOP120.3 - SPECHT 500 MACHINE OP120.5 - SPECHT 500 MACHINEOP130.1 - SPECHT 600 MACHINEOP130.2 - SPECHT 600 MACHINEOP130.4 - SPECHT 600 MACHINE		
Zone	All Zones Selected		
Station	All Stations Selected		
Jobs	All Jobs Selected		
Shift	All Shifts Selected		
Shift Type	All Shifts Type Selected		
Summary Level	Station		
Start Date	27-Aug-2017	End Date	24-Nov-2017
Area	AJ - AJ Engine Family	Shift	AllShiftsSelected
Team	-		
Department	6810 - AJ CYL BLOCK MC	Start Date	27-Aug-2017
Line	PAGBLOCK - AJ BLOCK MACHINING	End Date	24-Nov-2017



Equipment	Station	Facility Text	Bypass JPH	Tool Change JPH	Setup JPH	Shut Down JPH	E-Stop JPH	Waiting Att JPH	Repair JPH
OP320.1	B320-350.1	OP320_1	0	0.02	0.01	0.13	0	0.36	0.39
OP320.2	B320-350.2	OP320_2	0	0	0.01	0.16	0	0.2	0.08
OP320.3	B320-350.3	OP320_3	0	0.02	0.03	0.26	0	0.27	0.25
OP320.4	B320-350.4	OP320_4	0	0	0.48	0.31	0.01	0.13	0.15
OP350.1	OP350.1	OP350_1	0	0.03	0	0.68	0	0.57	0.1
OP350.2	OP350.2	OP350_2	0	1.35	0.4	0.63	0	0.81	1
OP350.3	OP350.3	OP350_3	0	0	0	0.57	0	0.46	0.18
OP070.1	B070.1	OP070.1	0	0.01	0.22	0.2	0	1.12	0.47
OP070.2	B070.2	OP070.2	0	0.01	0	0.51	0	0.88	0.13
OP070.3	B070.3	OP070.3	0	2.34	0.44	0.73	0.24	0.48	1.66
OP070.5	B070.5	OP070.5	0	0.03	0.05	0.25	0	0.89	0.87
OP080.1	B080.1	OP080.1	0	0.42	0.01	0.25	0	0.69	0.26
OP080.2	B080.2	OP080.2	0	0.04	0.03	0.08	0	0.72	0.52
OP080.3	B080.3	OP080.3	0	0.03	0.02	0.1	0	0.32	0.29
OP080.5	B080.5	OP080.5	0	0.04	0.02	0.08	0	0.24	0.04
OP100.1	B100.1	OP100.1	0	0.17	1.25	0.95	0	1.61	1.36
OP100.2	B100.2	OP100.2	0	0.14	0.9	0.54	0	0.67	0.26
OP100.3	B100.3	OP100.3	0	0.74	0.13	1.01	0.77	0.45	1.14
OP100.4	B100.4	OP100.4	0	0	0	0.03	0	0	0
OP100.5	B100.5	OP100.5	0	0.11	0.35	1.05	0	0.79	0.34
OP100.6	B100.6	OP100.6	0	0.38	0.06	1.05	0	0.45	0.28
OP110.1	B110.1	OP110.1	0	0.03	0.02	0.76	0	0.85	0.79
OP110.2	B110.2	OP110.2	0	0.01	0	0.27	0	1.29	0.24
OP110.3	B110.3	OP110.3	0	0.18	0.23	0.87	0	0.23	0.11
OP110.5	B110.5	OP110.5	0	0.01	0.04	0.16	0	1.41	0.05
OP120.1	B120.1	OP120.1	0	0.03	0.04	0.63	0	1.71	1.27
OP120.2	B120.2	OP120.2	0	0.03	0.02	0.83	0	1.58	0.92
OP120.3	B120.3	OP120.3	0	0.03	0.01	0.38	0	0.54	0.25
OP120.5	B120.5	OP120.5	0	0.04	0	0.31	0	0.83	0.6
OP130.1	B130.1	OP130.1	0	0.01	0.03	0.59	0	1.34	0.17
OP130.2	B130.2	OP130.2	0	0.2	0.12	0.51	0	0.45	1.82
OP130.4	B130.4	OP130.4	0	0	0	0.09	0	0.58	0.21

Facility Text	Jobs	Standard Cycle T	Pieces assumed 1
OP070.2	48 - Missing Job	><	Y

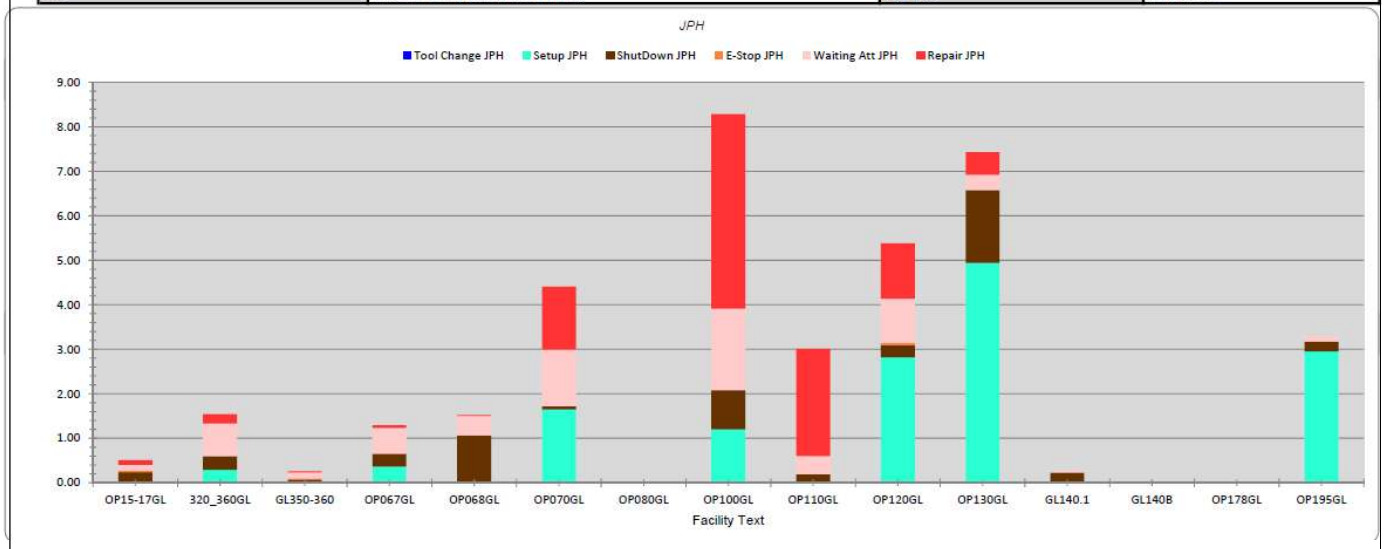
Averages-->	0.2015625	0.15375	0.4678125	0.031875	0.71625	0.50625	Sum = 2.08

12.5 Appendix 5

220 - DownTime By State Report

Selection Criteria

Area	AJ - AJ Engine Family		
Department	6810 - AJ CYL BLOCK MC		
Line	PAGBLOCK - AJ BLOCK MACHINING		
Cell	-		
Equipment	GL015 - GANTRY LOAD Op15GL340 - GANTRY LOAD Op340GL350-360 - GANTRY LOAD OP350/360GL067 - GANTRY LOAD OP067GL068 - GANTRY LOAD Op68 GL070 - GANTRY LOAD OP070GL080 - GANTRY LOAD OP080GL100 - GANTRY LOAD OP100GL110 - GANTRY LOAD OP110GL120 - GANTRY LOAD OP120 GL130 - GANTRY LOAD OP130GL140 - GANTRY LOAD OP140GL140B - GANTRY UNLOAD OP140GL178 - GANTRY LOAD OP178GL195 - GANTRY LOAD OP195		
Zone	All Zones Selected		
Station	All Stations Selected		
Jobs	All Jobs Selected		
Shift	All Shifts Selected		
Shift Type	All Shifts Type Selected		
Summary Level	Station		
Start Date	27-Aug-2017	End Date	24-Nov-2017
Area	AJ - AJ Engine Family	Shift	AllShiftsSelected
Team	-		
Department	6810 - AJ CYL BLOCK MC	Start Date	27-Aug-2017
Line	PAGBLOCK - AJ BLOCK MACHINING	End Date	24-Nov-2017



Equipment	Station	Facility Text	Bypass JPH	Tool Change JPH	Setup JPH	ShutDown JPH	E-Stop JPH	Waiting Att JPH	Repair JPH
GL015	B015GL	OP15-17GL	0	0	0	0.24	0.04	0.12	0.11
GL340	B340GL	320_360GL	0	0	0.29	0.31	0	0.73	0.21
GL350-360	350-360GL	GL350-360	0	0	0	0.07	0.03	0.13	0.03
GL067	B067GL	OP067GL	0	0	0.36	0.29	0.01	0.57	0.06
GL068	B068GL	OP068GL	0	0	0	1.06	0.01	0.43	0.02
GL070	B070GL	OP070GL	0	0	1.65	0.07	0	1.27	1.42
GL080	B080GL	OP080GL	0	0	0	0	0	0	0
GL100	B100GL	OP100GL	0	0	1.2	0.88	0	1.83	4.38
GL110	B110GL	OP110GL	0	0	0	0.19	0	0.41	2.41
GL120	B120GL	OP120GL	0	0	2.82	0.28	0.05	0.99	1.24
GL130	B130GL	OP130GL	0	0	4.94	1.64	0	0.34	0.51
GL140	140.1GL	GL140.1	0	0	0	0.23	0	0.04	0
GL140B	GL140B	GL140B	0	0	0	0	0	0	0
GL178	B178GL	OP178GL	0	0	0	0	0	0	0
GL195	B195GL	OP195GL	0	0	2.95	0.23	0	0.11	0

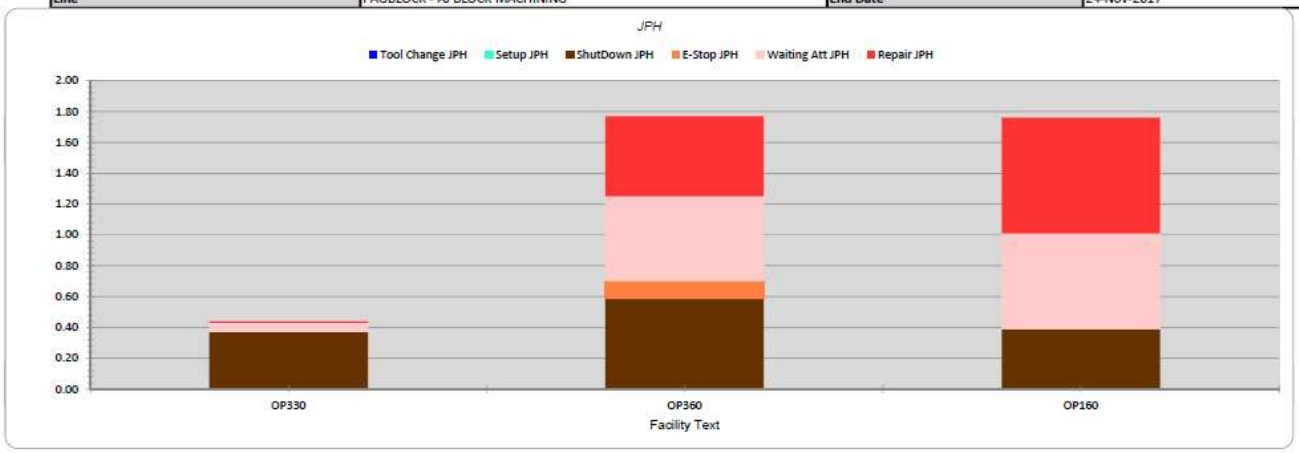
Facility Text	Jobs	Standard Cycle	Pieces assumed 1						
GL350-360	8 - Missing Jol><		Y		0.9473333	0.366	0.00933333	0.464666667	0.69266667	Sum	2.48
OP110GL	90 - Missing Jo><		Y								

12.6 Appendix 6

220 - DownTime By State Report

Selection Criteria

Area	AJ - AJ Engine Family		
Department	6810 - AJ CYL BLOCK MC		
Line	PAGBLOCK - AJ BLOCK MACHINING		
Equipment	OP330 - WASH - DURROP360 WASH - H.P.WASH/DEBURROP150 - H.P.WASH/DEBURROP160 - H.P.WASH/DEBURR		
Zone	All Zones Selected		
Station	All Stations Selected		
Parameter	All Parameters Selected		
Jobs	All Jobs Selected		
Shift	All Shifts Selected		
Shift Type	All Shifts Type Selected		
Start Date	27-Aug-2017	End Date	24-Nov-2017
Area	AJ - AJ Engine Family	Shift	AllShiftsSelected
Team	-		
Department	6810 - AJ CYL BLOCK MC	Start Date	27-Aug-2017
Line	PAGBLOCK - AJ BLOCK MACHINING	End Date	24-Nov-2017



Equipment	Station	Facility Text	Bypass JPH	Tool Change JPH	Setup JPH	ShutDown JPH	E-Stop JPH	Waiting Att JPH	Repair JPH	
OP330	B330	OP330	0	0	0	0.37	0	0.06	0.01	
OP360 WASH	OP360	OP360	0	0	0	0.59	0.11	0.55	0.52	
OP160	B160	OP160	0	0	0	0.39	0	0.62	0.75	
						0.45	0.03666667	0.41	0.42666667	Sum 1.32

12.7 Appendix 7

PLC Conditions Required to Transition into POS Monitoring Status



V1.0.0

PLC Conditions Required to transition into POS Monitoring Status

Document History

Version	Author	Date	Comments
V.0.0.1(1st Draft)	Terry Cowen	19th October, 1998	First Pass Draft - Not Official Release
V.0.0.2(2nd Draft)	Terry Cowen	22nd October	Second Pass Draft - Includes Word 4&5
V1.0.0	Terry Cowen	16th March 1999	Logged into SoftCm \softcm\pfscm\pos\pmon\support

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PLC Conditions Required to transition into POS Monitoring Status

Accompanying Documents

This document should be used in conjunction with other POS Monitoring documents:-
POS Monitoring Programmable Device Memory Map Specification
POS Monitoring Programmable Device Memory Map Implementation Guide

PLC Conditions Required to transition into POS Monitoring Status

Statuses in Order of Priority

1. No-Comms
2. Emergency Stop
3. Break
4. Repair
5. Waiting Attention
6. Toolchange
7. Setup
8. Shutdown
9. Bypass
10. Waiting Auxiliary Part
11. Starved
12. Blocked
13. Cycling

Statement of Status

These statuses are explained in reverse priority order if any of the higher priority status conditions are true then the machine will be in a higher priority status.

Cycling (13)

(The machine is cycling in automatic and no other status is true.)

The PLC must have **CRM** (Word 5 bit 14) and **Auto** (Word 5 bit 4) true and when **Request Cycle Start** (Word 5 bit 5) goes true the status will transition into ***Cycling***.

If the equipment does not have a specific Request Cycle Start button or double handed buttons, then there will be a transition into ***Cycling*** when **Cycle End** (Word 4 bit 5) goes true.

In the case where machines start to cycle when put into automatic the Request Cycle Start can be set at the same time that the machine is put into automatic. Then the status will transition into cycling as soon as the machine is put into automatic.

Cycling is the lowest of the status priorities, therefore if there are any other bits set that will force another status then that status will be true.
Cycling is the status that resets all other statuses that no longer have the conditions set to satisfy them.

If the machine was ***Blocked***, ***Starved*** or ***Waiting Auxiliary Material*** and is no longer then the machine will transition into ***Cycling***.

Blocked (12)

(The machine is in automatic and would be cycling but is at the step in the machine cycle where a part needs to be output from the machine but it is inhibited as the previous part has not been removed from the machine's output station. There is a configurable time delay in the 'Function Block' to ensure that the status does not transition to ***Blocked*** until the 'Work Standard' allowable time for unload has exceeded.)

The PLC must have CRM (Word 5 bit 14) and Auto (Word 5 bit 4) true and when Blocked (Word 5 bit 0) goes true the status will transition into Blocked.

The machine can only transition into Blocked if the previous status was cycling.

PLC Conditions Required to transition into POS Monitoring Status

Starved (11)

(The machine is in automatic and would be cycling but is at the step in the machine cycle where a part needs to be at the input station but it is inhibited as a new part is not available. There is a configurable time delay in the 'Function Block' to ensure that the status does not transition to ***Starved*** until the 'Work Standard' allowable time for load has exceeded.)

The PLC must have **CRM** (Word 5 bit 14) and **Auto** (Word 5 bit 4) true and when **Starved** (Word 5 bit 1) goes true the status will transition into ***Starved***.

The machine can only transition into Starved if the previous status was cycling.

Waiting Auxiliary Parts (10)

(The machine is in automatic and would be cycling but is at the step in the machine cycle that a part needs to be at the auxiliary input station but it is inhibited as a new auxiliary part is not available. There is a configurable time delay in the 'Function Block' to ensure that the status does not transition to ***Waiting Auxiliary Part*** until the 'Work Standard' allowable time for waiting for an auxiliary part has exceeded.)

The PLC must have **CRM** (Word 5 bit 14) and **Auto** (Word 5 bit 4) true and when **Empty Auxiliary Loader** (Word 5 bit 2) goes true the status will transition into ***Waiting Auxilary Part***.

The machine can only transition into Waiting Auxiliary Parts if the previous status was cycling.

Bypass (9)

(The machine is in automatic or manual and switched into Bypass, bypassing all operations performed by that machine. If in automatic the machine will be moving the part through the machine but have no effect on it. If in manual the machine will be not be doing anything and will not do anything until it is switched out of Bypass or Toolchange is selected.)

The PLC must have **CRM** (Word 5 bit 14) and **Auto** (Word 5 bit 4) may or may not be true and when **Bypass Selected** (Word 5 bit 11) goes true the status will transition into ***Bypass***.

Shutdown (8)

(The machine has been requested to stop at end of cycle and has reached cycle end (Manual Controlled Stop) or the machine has been placed into manual/not automatic mode and the previous status was not Waiting Attention or CRM is no longer on.)

The PLC **CRM** (Word 5 bit 14) may or may not be true and if true then when **Manual Controlled Stop** (Word 5 bit 6) goes true or **Manual Intervention** (Word 5 bit 8) goes true the status will transition into ***Shutdown***.

The Status will remain ***Shutdown*** until the machine starts to cycle again or a higher priority status exists.

PLC Conditions Required to transition into POS Monitoring Status

Setup (7)

(The machine is in the Setup mode as indicated by the fact the 'Setup' switch has been set or that the machine is going through a setup procedure.)

The PLC must have **CRM** (Word 5 bit 14) and **Auto** (Word 5 bit 4) is not true and when **Setup Mode** (Word 5 bit 10) goes true the status will transition into ***Setup.***

The Status will remain ***Setup*** until setup mode is no longer selected in manual mode and the machine has started to cycle again or the automatic setup procedure has completed or a higher priority status exists.

Toolchange (6)

(The machine has been requested to go to a toolchange position either by push button request or automatically by means of an elapsed tool counter and toolchange is in progress. Where toolchange can relate to any durable tool - Grinding Wheel, Cutting Tool, Welding Tool Tip etc.)

The PLC must have **CRM** (Word 5 bit 14) and **Auto** (Word 5 bit 4) is not true and when **Tool Change Selected** (Word 5 bit 9) goes true the status will transition into ***Toolchange.***

The status will remain ***Toolchange*** until the machine has started to cycle again or a higher priority status exists.

Waiting Attention (5)

(The machine has either a detectable fault, a constant monitored fault or a interlock fault, or a timed-out fault (the machine has not reached its end of cycle within a prescribed time or an EDDI sequence has not stepped on in the prescribed time.[It must be remembered that some of the sequences may knowing wait in specific steps i.e. when Blocked, Starved & Waiting Auxiliary Part and therefore some masking of these conditions will be necessary.))

The PLC must have **CRM** (Word 5 bit 14) and **Auto** (Word 5 bit 4) may or may not be true and when **In Fault** (Word 5 bit 13) goes true the status will transition into ***Waiting Attention.***

The status will remain ***Waiting Attention*** until Manual Intervention is indicated or the machine has started to cycle or a higher priority status exists.

Repair (4)

(The machine was in Waiting Attention and now Manual Intervention is indicated)

The PLC must have **CRM** (Word 5 bit 14) and **Auto** (Word 5 bit 4) is not true and when **Manual Intervention** (Word 5 bit 8) goes true the status will transition into ***Repair.***

The status will remain ***Repair*** until the machine has started to cycle or a higher priority status exists.

PLC Conditions Required to transition into POS Monitoring Status

Break (3)
(Break has been selected.)

Break (Word 5 bit 12) is true.

The status will remain ***Break*** until the machine has started to cycle or a higher priority status exists.

Emergency Stop (2)
(The machine has been requested to stop immediately, in an uncontrolled manner, by activating an Emergency Stop, Safety Beam, Pull Cord but not a Safety Gate.)

Manual Emergency Stop (Word 5 bit 7) is true.

The status will remain ***Emergency Stop*** until the machine has started to cycle or a higher priority status exists.

No-Comms (1)
(The machine PLC has failed to send any messages within the prescribed time-out (60 seconds). This could mean that a change of status or a 'Heartbeat' message has not been received from the PLC.)

No messages from the PLC.

The status will remain ***No-Comms*** until there is a valid status change from the PLC.

PLC Conditions Required to transition into POS Monitoring Status

Further Explanation of Cycle Type Bits (Word 4)

Dry Cycle

The **Dry Cycle** bit (Word 4 bit 0) is used to indicate that the machine is not performing a 'normal' machine cycle and as there is no part being produced some of the 'normal' cycle elements may not be performed and therefore this cycle will not be used within the average cycle time calculation. It must be true during the PLC scan that **Cycle End** (Word 4 bit 5) is set and remain set for at least one more PLC scan. A **Dry Cycle** is used to indicate the type of cycle that has been performed the machine status must be ***Cycling.***

Non Continuous Cycle

The **Non-Continuous** bit (Word 4 bit 1) is used to indicate that the machine is not performing a 'normal continuous cycle'. This could be that several 'warm up' cycles are being performed or cycles include single actions such as cascade spindle starting or a calibration process within the cycle or any cycle that a fault has been detected and therefore this cycle will not be used within the average cycle time calculation. It must be true during the PLC scan that **Cycle End** (Word 4 bit 5) is set and remain set for at least one more PLC scan. A **Non-Continuous Cycle** is used to indicate the type of cycle that has been performed the machine status must be ***Cycling.***

Good Productive Cycle

The **Good Productive Cycle** bit (Word 4 bit 2) is used to indicate that the machine cycle just performed resulted in good part(s) being produced. If the machine has no means of detecting bad/reject parts then this bit will be set for each cycle that resulted in a part being produced. It must be true during the PLC scan that **Cycle End** (Word 4 bit 5) is set and remain set for at least one more PLC scan. The combination of **Good Productive Cycle** and the two word Job ID (Words 12 & 13) identifies the number and type of parts that have been produced.

PLC Conditions Required to transition into POS Monitoring Status

Bad Productive Cycle

The **Bad Productive Cycle** bit (Word 4 bit 3) is used to indicate that the machine cycle just performed resulted in bad/reject part(s) being produced. If the machine has no means of detecting bad/reject parts then this bit will not be set for any cycle that resulted in a part being produced. It must be true during the PLC scan that **Cycle End** (Word 4 bit 5) is set and remain set for at least one more PLC scan. The combination of **Bad Productive Cycle** and the two word Job ID (Words 12 & 13) identifies the number and type of parts that have been produced.

Cycle Start

The **Cycle Start** bit (Word 4 bit 4) is used internally, by the function block, to start timing a cycle. It must go true on the activation of the first element of the machine's cycle and remain true until **Cycle End** (Word 4 bit 5) is set and remain set for at least one more PLC scan.

Cycle End

The **Cycle End** bit (Word 4 bit 5) is used internally, by the function block, to finish timing a cycle. It must go true on the completion of the last element of the machine's cycle and remain true for at least one more PLC scan and then will be false.

The setting of this bit will initiate the unsolicited sending of a memory map.

Out of Cycle Dress Cycle

The **Out of Cycle Dress Cycle** bit (Word 4 bit 6) is used to indicate that a dressing cycle is being performed outside of the normal machine cycle. This bit is used so that the dress cycle can be separately timed. The status will remain ***Cycling*** whilst the dressing cycle is in progress. The **Cycle Start** bit (Word 4 bit 4) must be set at the being of the dress cycle and the **Cycle End** bit (Word 4 bit 5) set at the end of the dress cycle. All three bits must remain set until one PLC scan after the **Cycle End** bit (Word 4 bit 5) is set.

PLC Conditions Required to transition into POS Monitoring Status

Further Explanation of Status Bits (Word 5)

The setting of any of the bits in Word 5 this will initiate the unsolicited sending of a memory map.

Blocked

The **Blocked** bit (Word 5 bit 0) is used to indicate that the machine has stopped cycling as it has reached the step in the cycle where it is ready to move a machined part to the output station in is prevented from doing so as there is a previously machined part still waiting to be removed from the output station. There is a delay that can be configured to match the Work Standard allowable time for unload. The bit will be set all the time that the delay has elapsed and that the part is not cleared from the output station. The cycle timer will be held all the time this bit is true.

Starved

The **Starved** bit (Word 5 bit 1) is used to indicate that the machine has stopped cycling as it has reached the step in the machine cycle where it requires a new part and there is no new part available at the input. There is a delay that can be configured to match the Work Standard allowable time for load. The bit will be set all the time that the delay has elapsed and there is no part at the load station. The cycle timer will be held all the time this bit is true.

Empty Aux. Loader

The **Empty Auxiliary Loader** bit (Word 5 bit 2) is used to indicate that the machine has stopped as it has reached the step in the machine cycle where it requires a new auxiliary part (bolt, sunroof, core plug etc.) and there is no new auxiliary part available. There is a delay that can be configured to match the Work Standard allowable time for auxiliary part load. The bit will be set all the time that the delay has elapsed and there is no part at the auxiliary load station. The cycle timer will be held all the time this bit is true.

Pass-Through Cycle

The **Pass-Through Cycle** bit (Word 5 bit 3) is set if the machine has detected that the part did not need to be machined and the machine has reached its end of cycle i.e. this machine is used to mount turbo charges and the engine just passed trough the machine is not a turbo charged engine or it could have been rejected by a previous operation that determines that this operation is no longer valid.

Auto

The **Auto** bit (Word 5 bit 4) is set when the machine is in Automatic mode i.e. Automatic is selected. It does not indicate that the machine is cycling or been requested to cycle.

Request Cycle Start

The **Request Cycle Start** bit (Word 5 bit 5) is set when the machine has been requested to start cycling. This could be the pressing of a button or two handed control buttons, the first time closing of a load gate after selecting automatic or in some cases where there is no other action required, then this bit could be set at the same time as the **Auto** bit (Word 5 bit 4).

PLC Conditions Required to transition into POS Monitoring Status

Manual Controlled Stop

The **Manual Controlled Stop** bit (Word 5 bit 6) is set to indicate that the machine has stopped cycling at its end of cycle because it was requested to do so. The machine was stopped in a controlled manner and not stopped due to an Emergency Stop or any other unusual stoppage.

Manual Emergency Stop

The **Manual Emergency Stop** bit (Word 4 bit 7) is set if the machine has been stopped in an uncontrolled manner, by activating an emergency stop, pullcord etc.

Manual Intervention

The **Manual Intervention** bit (Word 5 bit 8) is set to indicate that there is an operator in attendance. It is set if the machine is placed into manual mode or taken out of automatic mode a safety guard is opened or any other such manual action is detected.

Tool Change Selected

The **Tool Change Selected** bit (Word 5 bit 9) is set when there is an indication that a toolchange is requested, this may be by push button request to send the machine into a tool change position or that a tool change counter has reached its prescribed count and the machine has automatically gone to the tool change position.

Setup Mode

The **Setup Mode** bit (Word 5 bit 10) is set whilst the machine is being setup. This could be due to changeover, process change, calibration run etc. It should remain set until the setup routine has completed and any required trial pieces have run through the machine.

Bypass

The **Bypass** bit (Word 5 bit 11) is set all the time that the machine has been manually requested to bypass its operations. The machine may be acting as a transfer mechanism passing parts through the machine or it may be doing nothing at all.

Break

The **Break** bit (Word 5 bit 12) is set to indicate the time that the machine is not required to cycle as there is a break period.

In Fault

The **In Fault** bit (Word 5 bit 13) is set when a fault is detected by either immediate detection, constant monitored zone or interlock fault, or by a timed out fault, the cycle did not complete within the prescribed time or the EDDI sequence did not step on within the prescribed time. A test should be made to ensure that the fault code is available before the fault bit is set.

PLC Conditions Required to transition into POS Monitoring Status

CRM On

The **CRM On** bit (Word 5 bit 14) is set all the time there is control voltage is available.

Heartbeat/Timeout

The 'Function Block' sets the **Heartbeat/Timeout** bit (Word 5 bit 15) for at least one PLC scan and then reset every 60 secs if there is no other reason to send a memory map message. This bit is used to inform the system that the PLC is in communications. If the Data Concentrator PC does not receive a message within 90 secs the PLC communications will be assumed to have failed.

The 'Function Block' will keep the PLC in communications if the Heartbeat timer is configured correctly.

12.8 Appendix 8

POS MONITORING PROGRAMMABLE DEVICE MEMORY MAP



IMPLEMENTATION GUIDE

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1. Introduction

Significant improvements have been made in machining and assembly productivity as a result of automatic collection of machine productivity data. Productivity data is a key element in bottleneck analysis and machine efficiency improvements. POS Monitoring is a key element in overall strategy for overall data collection.

This Implementation Guide is intended to serve as an aid to OEMs and plant personnel implementing the POS Monitoring PLC Memory Map standard. In most instances, the memory map will be implemented in conjunction with a standardized version of a logic function block designed specifically to facilitate POS monitoring, and tailored to the characteristics of that particular controller type.

Users of this guide should have access to, and be familiar with the contents of:

POS Monitoring Programmable Device Memory Map Specification V2.0
POS Monitoring PC Based Data Concentrator Data Set Generator Design Specification V2.0

In addition, users should have access to the POS Monitoring PLC Memory Map Function Block documentation related to the specific controller they are integrating. These documents are available to the Ford Designated Contact via the Visual Factory and Controls Ford Intranet Web home page.
Development of function blocks for additional devices is on-going. If the device you are interested in is not listed, please contact persons listed on the web home page for additional information.

2. Controls Programmer Responsibilities

POS Monitoring expects the machine control device to provide three sets of information.

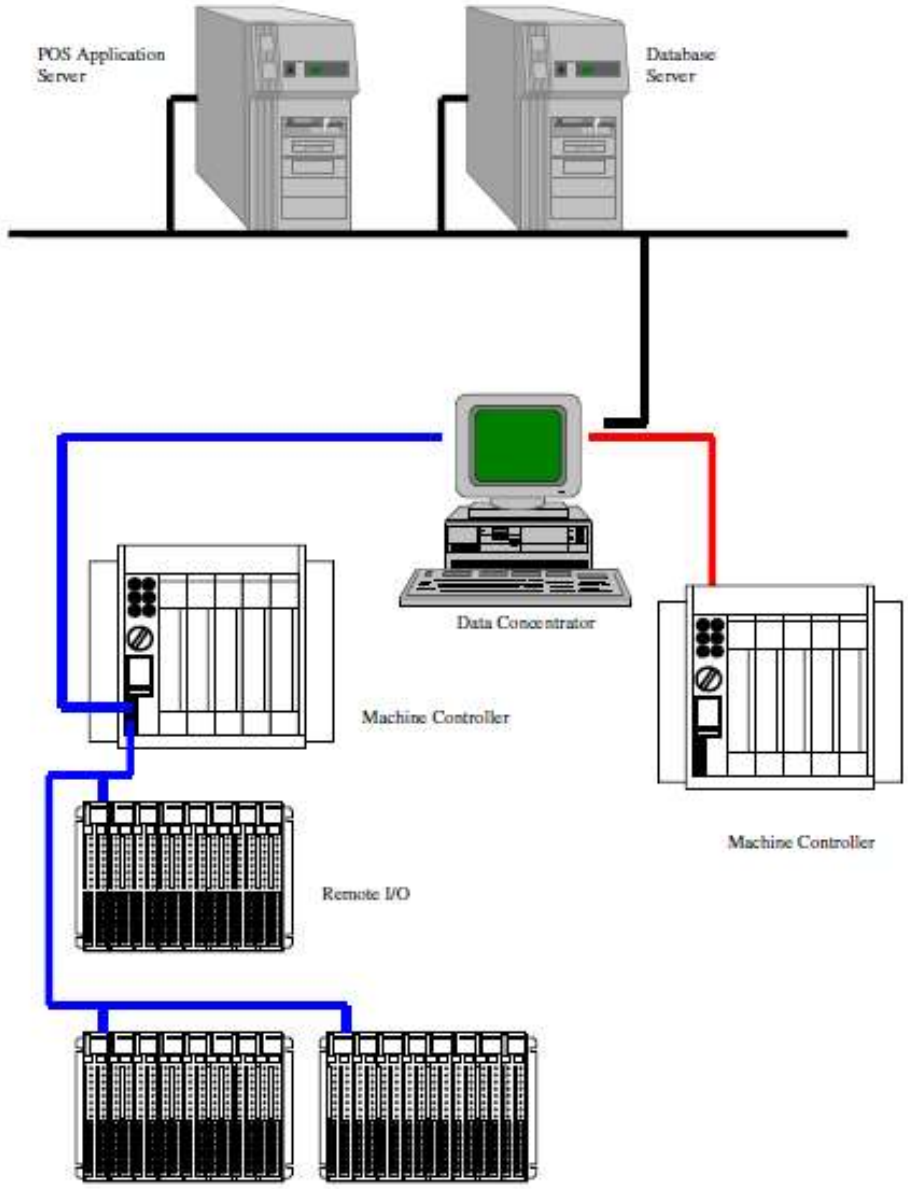
Message Header Data: Information required by the monitoring system to identify the equipment being monitored and the source of the data being provided.

Signal Generation: The signal generation layer defines all of the discrete inputs required to produce the productivity monitoring memory map. Signal generation inputs are derived from the machine control logic conforming to definitions in the PLC Memory Map documentation.

Accumulated Data: Using the discrete signals defined in signal generation, the machine control system will accumulate data that is time critical and cannot be processed quickly enough outside of the machine control system.

It is the responsibility of the Ford Designated Contact to define the monitoring requirements for the equipment to be monitored. For each piece of equipment monitored, the control program provider will provide one full memory map set of data in the correct format. Where multiple pieces of equipment are controlled by a single machine control system, the full memory map will be replicated for each piece of equipment.

Figure 1 - Data Collection Architecture



Note:
The Ford Designated Contact in conjunction with the control's supplier should complete the Specific Configuration form (see Appendix B) for each monitored equipment item

3. POS Monitoring PLC Memory Map

It is the responsibility of the control program provider to review their control logic and provide the required productivity information in the memory map format that follows. Table 1 and Table 2 illustrate the POS Monitoring PLC Memory Map.

In an effort to minimize programming effort, alleviate the variability in implementation, and to minimize the confusion in interpretation, a family of logic function blocks has been designed that assists populating the POS Monitoring Memory Map in a standardized fashion in the machine controller. These function blocks vary in design according to the capabilities of the machine controllers they run on, but the approach is common across all device types.

Note:
Shaded areas in the tables represent memory entities which are either provided by the appropriate logic function block, or are not required to be populated at this time. In either case, no user logic programming is required for these areas.. (Refer to Appendix C for more detailed definition of the memory map data elements)

Table 1 - PLC Memory Map Words 1-6

Memory Map Word	Function	Bit	Name	Description	Data Type
1	Trans. No.		Transaction Counter	Counter incremented when message sent to data concentrator	Word
2	Facility ID		Data Source ID	Unique ID assigned by the plant	Word
3	Message Type		Message Type	Message type being sent (Set to 100 for POS Monitoring)	Word
4	Cycle Type	0	Dry Cycle	Cycle which does not produce a part	Latched Bit
		1	Non-Continuous	Cycle interrupted for reasons other than blocked, starved or waiting	Latched Bit
		2	Good Productive Cycle	Set when part produced at cycle end is good part or not rejected	Latched Bit
		3	Bad Productive Cycle	Set when part produced at cycle end is rejected	Latched Bit
		4	Cycle Start	Set when first element of equipment's cycle is activated	Latched Bit
		5	Cycle End	Set when final element of equipment's cycle has completed	Latched Bit
		6	Out of Cycle, Dress Cycle	Set when equipment performs out of cycle dressing cycle	Latched Bit
		7	Reserved		Bit
		8	Reserved		Bit
		9	Reserved		Bit
		10	Reserved		Bit
		11	Reserved		Bit
		12	Reserved		Bit
		13	Reserved		Bit
		14	Reserved		Bit
		15	Reserved		Bit
5	Equipment Status	0	Blocked	Set when machine cycle cannot continue due to part at discharge	Transitional Bit
		1	Starved	Set when no part present at infeed, and machine cannot continue	Transitional Bit
		2	Empty Aux. Loader	Set when parts are not available at auxiliary part load station	Transitional Bit
		3	Pass-Through Cycle	Set when machine performs no action on part produced	Transitional Bit
		4	Auto	Set when machine is in automatic mode	Transitional Bit
		5	Request Cycle Start	Set when machine is in auto mode, and operator selects 'start'	Transitional Bit
		6	Manual Controlled Stop	Set when machine is stopped by operator (Not Emergency Stop)	Transitional Bit
		7	Manual Emergency Stop	Set when machine is stopped by operator via E-stop or pullcord	Transitional Bit
		8	Manual Intervention	Set when personnel are detected (ie. safety gate, man mode select)	Transitional Bit
		9	Tool Change Selected	Set when operator has selected 'tool change', reset when complete	Transitional Bit
		10	Setup Mode	Set when setup in progress (changeover, process change)	Transitional Bit
		11	Bypass Selected	Set when 'bypass mode' selected for this machine	Transitional Bit
		12	Break	Set when operator has selected 'break mode'	Transitional Bit
		13	In Fault	Set when machine enters a 'fault state'	Transitional Bit
		14	CRM On	Set when field power is applied to machine controls	Transitional Bit
		15	Heartbeat/Timeout	Set by PLC when no message has been sent for designated period	Transitional Bit
6	Operator Input	0	PM Task Completed	Set when required PM task completed	Transitional Bit
		1	Tool Change Acknowledged	Set when operator acknowledges prompt for tool change	Transitional Bit
		2	Quality Check In Progress	Set when operator performing a quality check	Transitional Bit
		3	Assistance Request Type 1	Operator initiated request to message display system	Transitional Bit
		4	Assistance Request Type 2	Operator initiated request to message display system	Transitional Bit
		5	Assistance Request Type 3	Operator initiated request to message display system	Transitional Bit
		6	Assistance Request Type 4	Operator initiated request to message display system	Transitional Bit
		7	Assistance Request Type 5	Operator initiated request to message display system	Transitional Bit
		8	Reserved		Bit
		9	Reserved		Bit
		10	Reserved		Bit
		11	Reserved		Bit
		12	Reserved		Bit
		13	Reserved		Bit
		14	Reserved		Bit
		15	Reserved		Bit

Note:

- Bit 0 is assumed to be the least significant bit
- Shaded areas represent data provided by the standard function block, no user input is required

- **Table 2 - PLC Memory Map Words 7-40**

Memory Map Word	Function	Bit	Name	Description	Data Type
7	Cycle Time		Last Cycle Time	Cycle time of last machine cycle completed	Word
8	Cycle Count		Accumulated Cycle Time Count	Number of cycle times in last cycle time word (Set to 1 if no accum.)	Word
9	Good Cycles		Total Good Machine Cycles	Number of productive machine cycles in which all good parts produced	Word
10	Bad Cycles		Total Bad Machine Cycles	Number of productive machine cycles in which some parts were bad	Word
11	Total Cycles		Total Cycles	Total machine cycles	Word
12	Process ID #1		Process/Product Configuration	Plant-assigned code indicating part/process configuration	Word
13	Process ID #2		Process/Product Configuration	Plant-assigned code indicating part/process configuration or type	Word
14	Fault #1		Fault Code Word 1	Code assigned in conjunction with plant fault definition	Word
15	Fault #2		Fault Code Word 2	Code assigned in conjunction with plant fault definition	Word
16	Fault #3		Fault Code Word 3	Code assigned in conjunction with plant fault definition	Word
17	Reason Code		Reason Code	Reason code entered for current fault (Operator input)	Word
18	Warning #1	0	PLC Battery Bad	Standard warning	Transitional Bit
		1	Tool Life Nearly Expired	Standard warning	Transitional Bit
		2	Gage Approaching Reject	Standard warning	Transitional Bit
		3	Hydraulic Tank Low Pressure	Standard warning	Transitional Bit
		4	Bolt Hopper Low	Standard warning	Transitional Bit
		5	Low Air Pressure	Standard warning	Transitional Bit
		6	Hydraulic Filter Dirty	Standard warning	Transitional Bit
		7	Lube Low Level	Standard warning	Transitional Bit
		8	Line Stop	Standard warning	Transitional Bit
		9	Reserved		Bit
		10	Reserved		Bit
		11	Reserved		Bit
		12	Reserved		Bit
		13	Reserved		Bit
		14	Supervisor Call	Standard warning	Transitional Bit
		15	Material Call (Low Level)	Standard warning	Transitional Bit
19	Warning #2	0	Custom Warning 0	Plant-defined custom warning	Transitional Bit
		1	Custom Warning 1	Plant-defined custom warning	Transitional Bit
		2	Custom Warning 2	Plant-defined custom warning	Transitional Bit
		3	Custom Warning 3	Plant-defined custom warning	Transitional Bit
		4	Custom Warning 4	Plant-defined custom warning	Transitional Bit
		5	Custom Warning 5	Plant-defined custom warning	Transitional Bit
		6	Custom Warning 6	Plant-defined custom warning	Transitional Bit
		7	Custom Warning 7	Plant-defined custom warning	Transitional Bit
		8	Custom Warning 8	Plant-defined custom warning	Transitional Bit
		9	Custom Warning 9	Plant-defined custom warning	Transitional Bit
		10	Custom Warning 10	Plant-defined custom warning	Transitional Bit
		11	Custom Warning 11	Plant-defined custom warning	Transitional Bit
		12	Custom Warning 12	Plant-defined custom warning	Transitional Bit
		13	Custom Warning 13	Plant-defined custom warning	Transitional Bit
		14	Custom Warning 14	Plant-defined custom warning	Transitional Bit
		15	Custom Warning 15	Plant-defined custom warning	Transitional Bit
20	Warning #3		Custom Warning Code Word 3	Plant defined warning code (4-character 1-9999)	Word
21	PLC Checksum		Program Change Indicator	Word set when PLC program is altered (Version no. or checksum)	Word
22			Reserved		Word
* * *			* * *		
40			Reserved		Word

Note:

- Bit 0 is assumed to be the least significant bit
- Shaded areas represent data provided by the standard function block, no user input is required

3.1 PLC Memory Map Function Block

Typically there are three sections within the function block; the Input to the POS Block, the POS Data Accumulation Block, and the POS Send Logic.

3.1.1 Input to POS Block

Generally, the user is responsible to provide enabling logic for the Input to the POS Block segment. The Input segment includes all template definitions for memory map words 2, 3, 4, and 5, requiring the user only to program the enabling logic.

In addition, the user must input parameters for the heartbeat, delay blocked, delay starved, and poll delay timers (if applicable), and the preset value for cycle count if accumulation is required.

3.1.1.1 Message Header

Several elements are required by POS Monitoring to identify the monitored device, and the controller that is sending the message. Words 1, 2, and 3 make up the message header. Word 1 is the transaction counter, and is populated automatically by the standard function block.

Note :
The message types will be assigned in blocks for a particular application. POS Monitoring will be assigned the range 100 - 199. The message type will be used to incorporate a message version number, i.e. if it becomes necessary to add a new field, the subsequent message will be allocated a different message type.

3.1.1.2 Signal Generation

Discrete signals required to meet the signal generation requirements are generally available within the machine control logic. These signals provide the POS monitoring system with machine status information necessary to report machine status and productivity. Words 4, 5, and 6 map the state of these discrete signals.

Note:
- Cycle Start and End must be set for all cycles (including 'out of cycle dress cycles', and 'dry cycles') and are optional for 'pass through' and 'bypass' cycles
- If the equipment has to either dress or calibrate for each part produced then the time to perform these actions will be included in the average cycle time.
- Latched signal will "latch" and maintain its state until at least one scan after the machine cycle ends
- Transitional signal remains on as long as the input conditions are met

- Process conditions may require the use of a delay before setting blocked, starved, or empty aux. Loader bits. Examples requiring state change delay are: manually loaded /unloaded machines and gantry fed machines. In these cases, the state change delay preset must be set by the controls logic programmer.
- Word 6 - Operator Input is a Ford Production System requirement for Manual operator entry devices, and no provision for populating these bits is provided in the standard function block

3.1.1.3 Diagnostics

Diagnostic information is classified in two categories: Machine Faults and Machine Warnings. The controls programmer is responsible for populating the Fault code words 14, 15, 16, and the Reason Code word 17 (if required).

3.1.1.3.1 Machine Fault Definition

Every time the machine enters the Fault mode, a primary fault must be established. The primary fault is latched (may not change value until the fault has been transmitted to the Data Concentrator) and is present in the same scan in which the fault bit is set. The controls programmer is only required to apply the fault logic templates in the Input to the POS Block segment of the standard function block, by supplying the required conditional logic. The function block automatically latches the data, and detects the fault as a change in the equipment status word, and initiates a 'send' message to the data concentrator.

3.1.1.3.2 Machine Fault Location Definition

A unique location identification code may be used for each sub-unit of a monitored machine, if present (e.g. each station on a transfer machine or each location on an assembly machine). The location identification code shall be present at the time the machine fault mode is defined. Where the machine being monitored does not have sub-units or the fault is not in a sub-unit, the Main Station code is to be used. Refer to the Specific Configuration form (Appendix A) for details.

Table 3 - Location Codes (Sample)

	Station Code	Example
Main	**100**	**100**
Left Station or Location	**200 + Station #**	**Sta. 2L -> 202**
Right Station or Location	**300 + Station #**	**Sta. 13R -> 313**
Station or Location (not left or right)	**400 + Station #**	**Sta. 5 -> 405**

3.1.1.3.3 Warning Definition

Warnings are non-critical events that may occur while the machine is running or not. The standard function block does not populate Warning words 18, 19, or 20. However, changes to these words loaded by any user programs, will be detected by the function block, and will automatically initiate a POS 'send' message.

Multiple warnings may occur simultaneously. Sixteen "Standard " warnings are listed in the PLC Memory Map word 18. Control logic providers who have specific warnings in addition to those provided may add additional "custom" warnings in word 19. Each bit in a warning word represents a specific warning. If the bit is set, there is a warning present. Word 20 is a word element for retrieving a warning code, typically such as that provided by several motion controllers.

Note:
Words 18 and 19 support concurrent warning bits, word 20 does not support concurrent codes

4. POS Function Block

4.1 POS Data Accumulation Block

Words 7,8,9,10, and 11 are derived using the signal generation information. When using a standard function block, no additional logic programming is required to generate this data. The POS Data Accumulation segment of the standard function block performs the calculation and data store function.

The user is required to populate the Process/Product Configuration ID Words 12 and 13. Typically, word 12 can be coded to indicate the number of parts produced per machine cycle, and word 13 coded to indicate the part type produced. Configuration of words 12 and 13 in the memory map are the responsibility of the controls programmer.

Note:

- In cases where network throughput is exceptionally slow or polling is used, the Ford Designated Contact may specify use of Cycle Time Accumulation. In this case, the cycle time of each cycle is ADDED to the value in the last cycle time word by the function block. The controls programmer must include provision for configuring the Cycle Count Accumulation preset value.
- Counter values are roll counters (ie. counter that is never reset, retains its value when the controller stops, counts up to 9998 and is set to 0000 on the next count after 9998).
- POS monitoring correlates machine cycle time with part (derivative) type. For this reason, while the function block updates part counters and cycle times, the controls programmer must also ensure process/product configuration words for each part produced remains in the storage words until at least one scan after the end of machine cycle.

4.1.1 POS Send Block

In the general case; unsolicited messages will be sent to a PC data Concentrator which will, in turn buffer the messages and forward them to the POS Data Collector. However, POS can accommodate a solicited network environment for those facilities using machine controllers that do not support unsolicited messaging.

Data Concentrators have the ability to communicate with several different programmable device types concurrently, and forward data to other devices in a standard, device independent format.

The full POS Monitoring memory map will be transmitted to the data concentrator each time a part is produced or the machine state changes. The standard function block POS Send segment performs the message buffer and send process. This process is transparent to the user, and in general, users should not modify the logic within the POS Send segment.

Note:
- Controls programmers must analyze anticipated network response, to properly configure default poll and message timeout parameters within the standard function block for the environment they are operating in
- Controls programmers may be required to specify the address of the Unsolicited Write Instruction Buffer for applications where that buffer location varies according to station communication ID (refer to the function block documentation for the specific contoller)

4.2 Message Triggers

A new message containing the full memory map is sent by the standard function block, each time there is a change in any of:

- Cycle End (Word 4, bit 5)
- Transition Status Words (Words 5 or 6)
- Warning Words (Words 18, 19, 20)
- Fault Reason Code (Word 17)
- Out of Cycle Dress Cycle (Word 4, Bit 6)

These words are monitored each scan and a message sent when a change occurs.

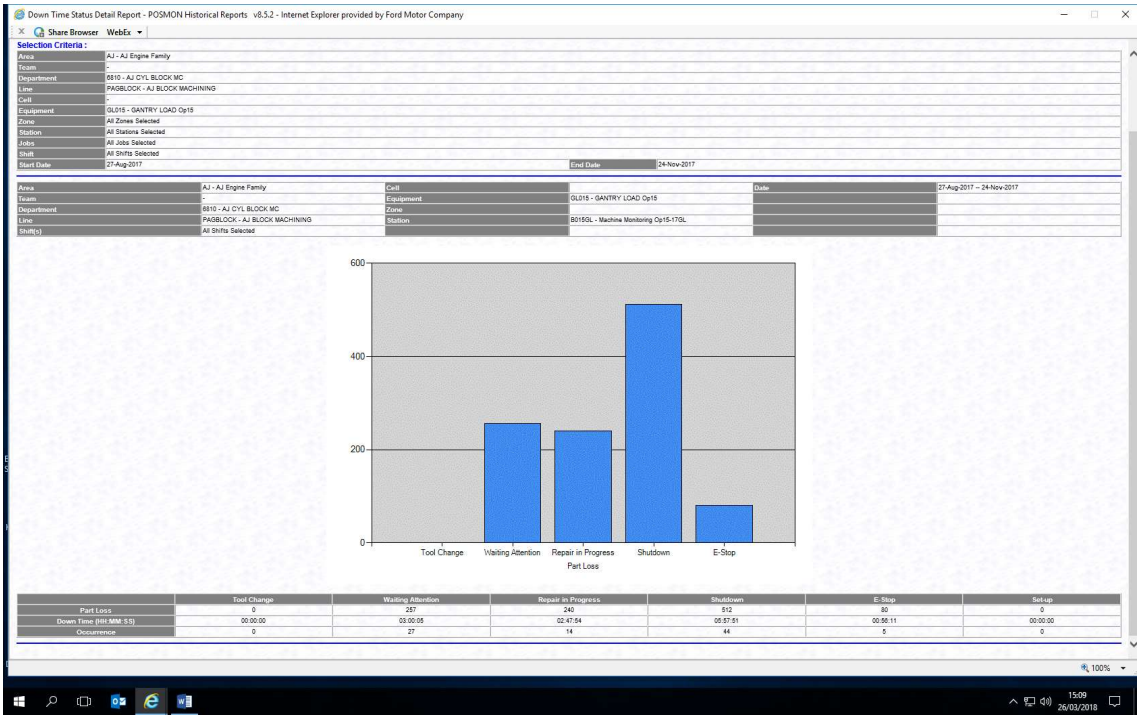
Note: Where Cycle Time Accumulation is specified, a message is not sent on cycle end until the specified maximum number of parts has been reached.

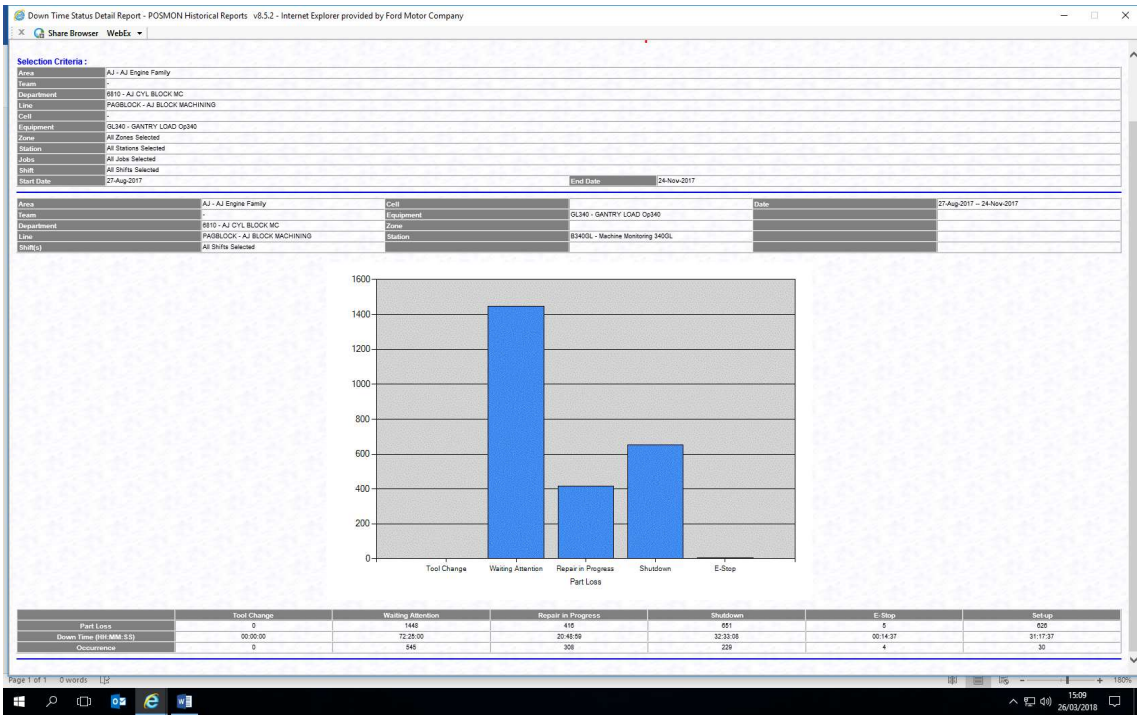
4.3 Message Buffering

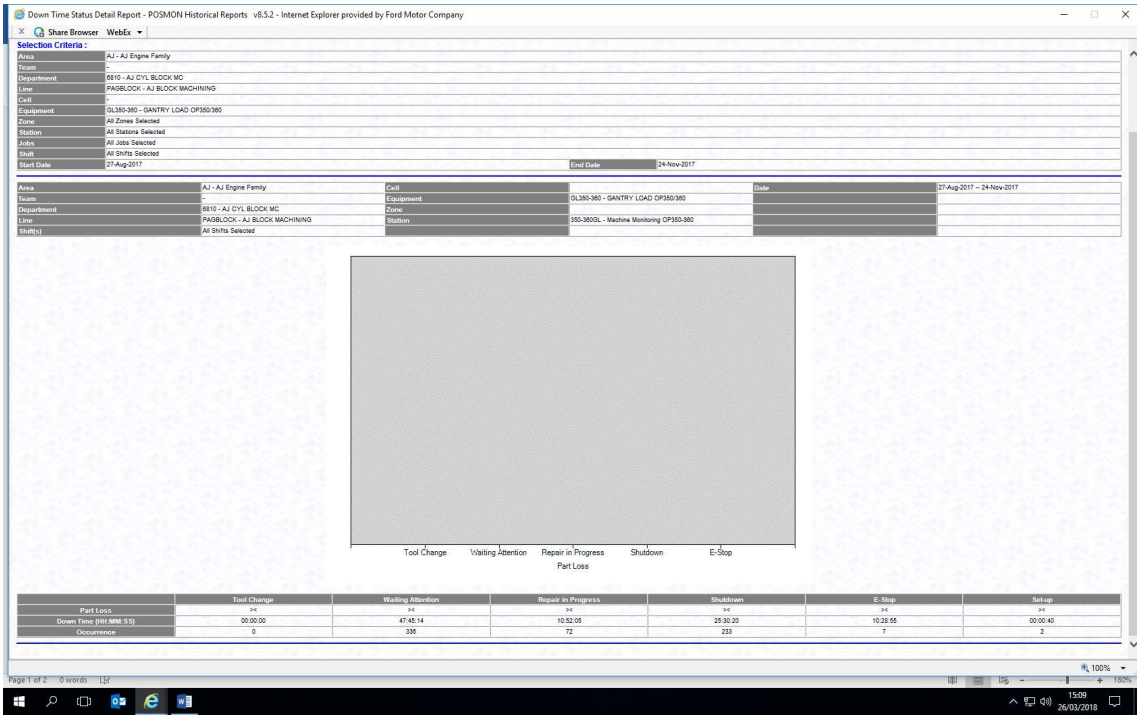
When a change is detected in the memory map, the full memory map must be copied to the write buffer to prevent loss of data. The write buffer is a temporary storage location that serves to:

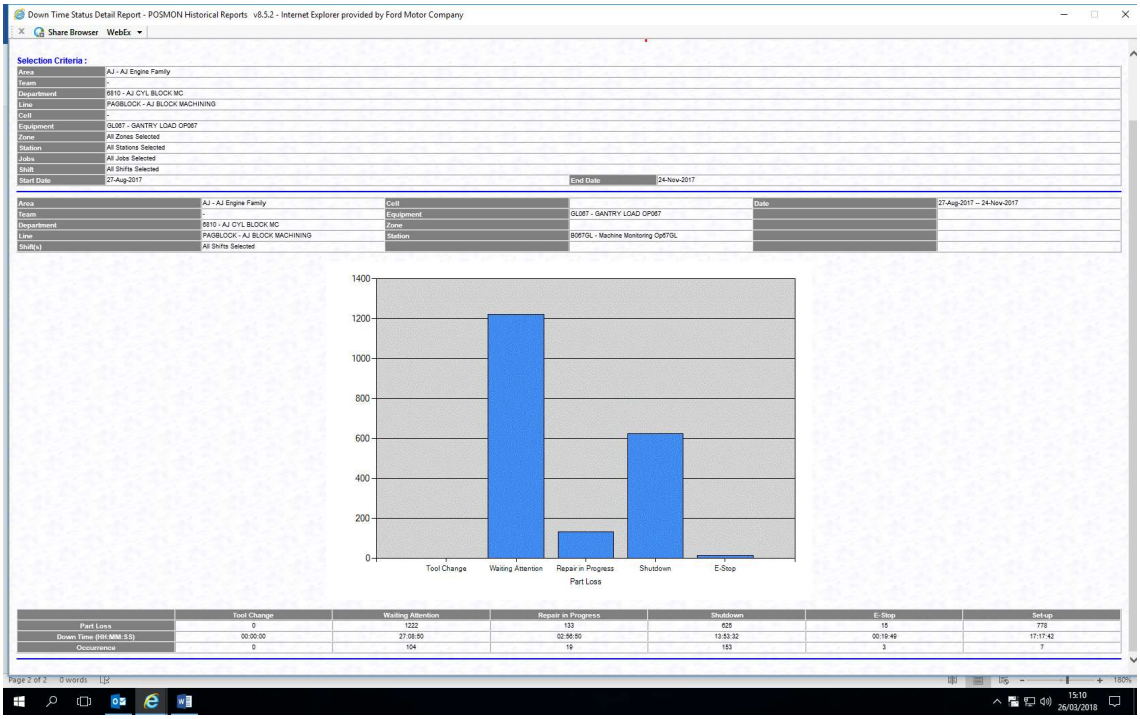
- Save data from the memory map before it changes
- Hold data to send to the data concentrator if the PLC write instruction is active
- Provide a base for comparison to the current memory map (for change detection)

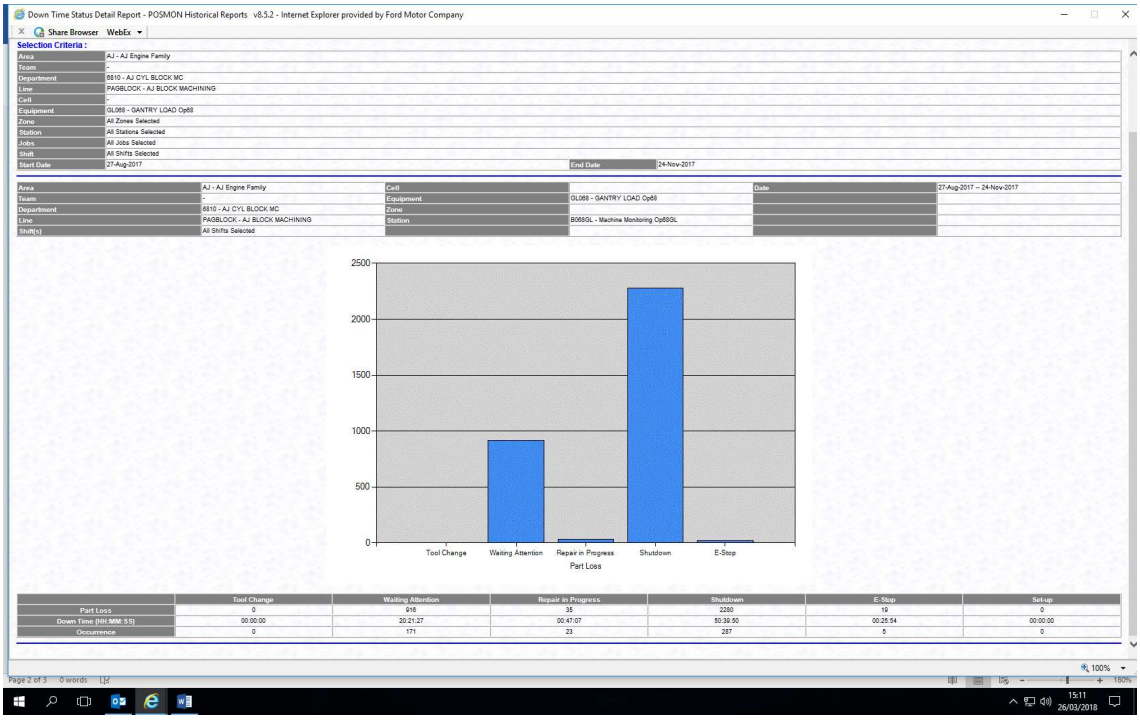
12.9 Appendix 9

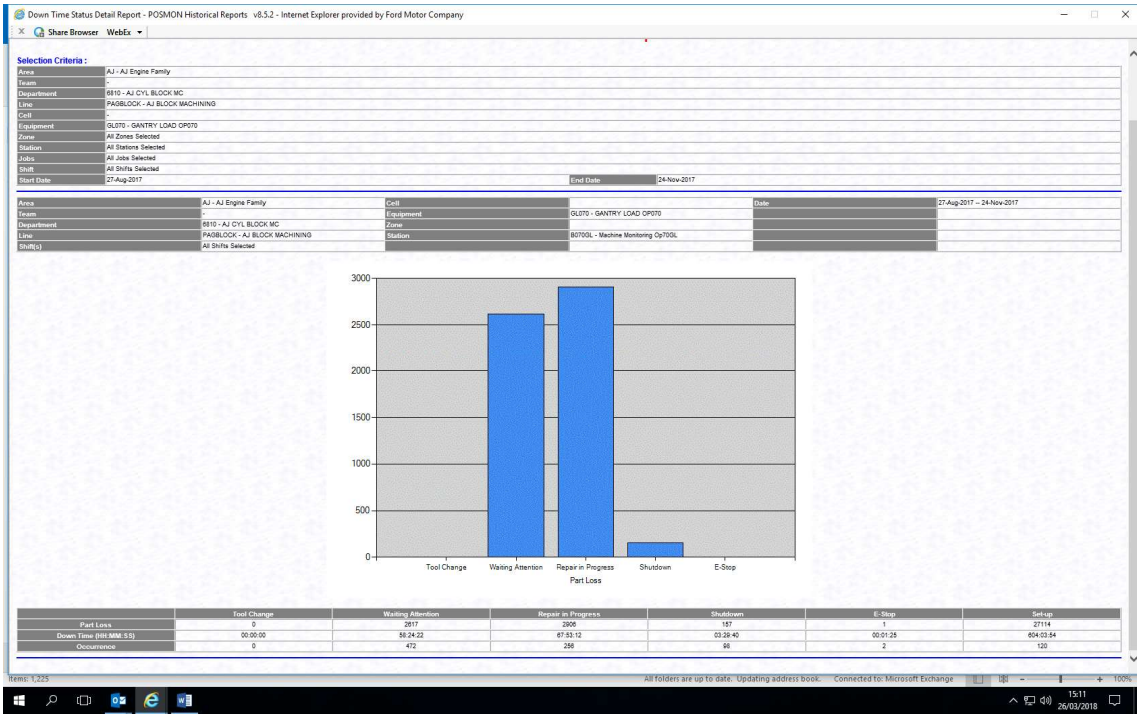


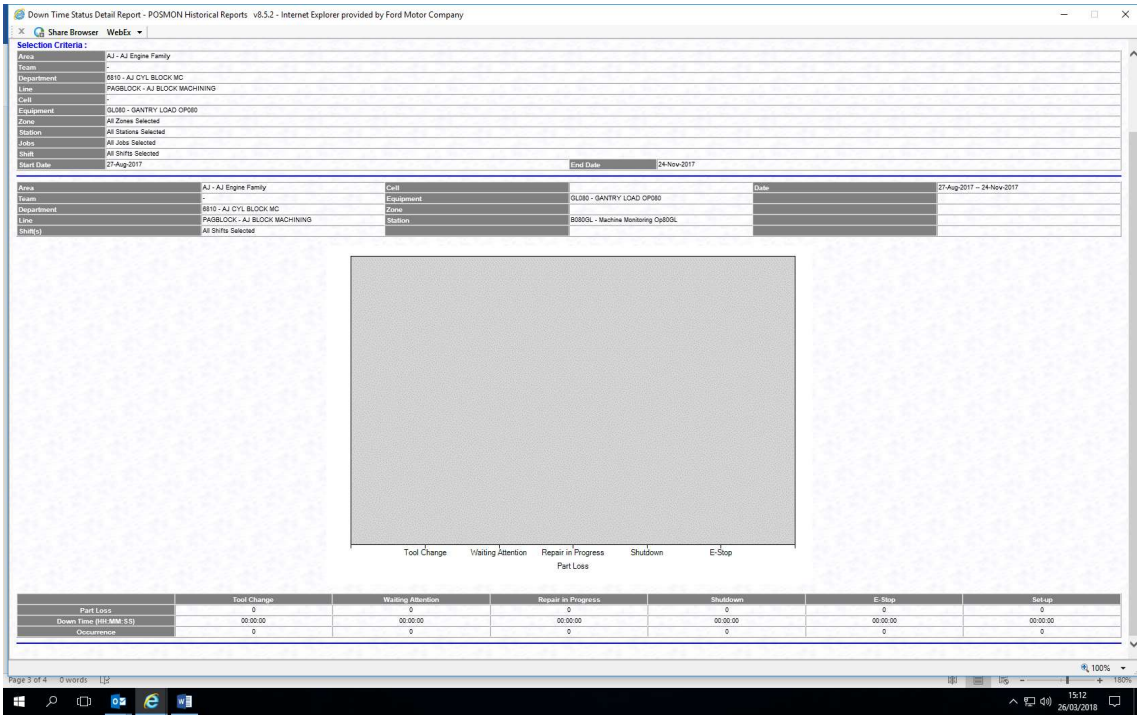


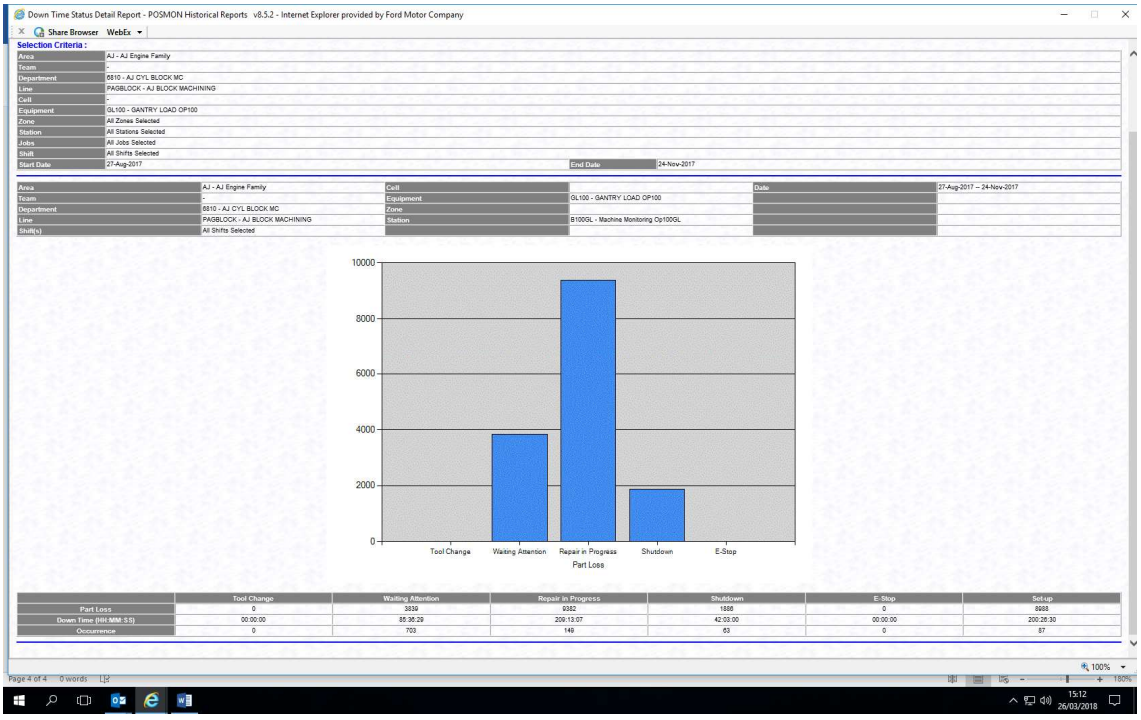

Down Time Status Detail Report - POSMON Historical Reports v8.5.2 - Internet Explorer provided by Ford Motor Company
Share Browser WebEx
Selection Criteria :
Area AJ - AJ Engine Family
Team -
Department 6810 - AJ CYL BLOCK MC
Line PAGBLOCK - AJ BLOCK MACHINING
Cell -
Equipment GL350-360 - GANTRY LOAD OP350/360
Zone All Zones Selected
Station All Stations Selected
Jobs All Jobs Selected
Shift All Shifts Selected
Start Date 27-Aug-2017
End Date 24-Nov-2017
Area AJ - AJ Engine Family
Team -
Department 6810 - AJ CYL BLOCK MC
Line PAGBLOCK - AJ BLOCK MACHINING
Shift(s) All Shifts Selected
Cell
Equipment GL350-360 - GANTRY LOAD OP350/360
Zone
Station 350-380GL - Machine Monitoring OP350-380
Date 27-Aug-2017 – 24-Nov-2017
Tool Change
Waiting Attention
Repair in Progress
Shutdown
E-Stop
Part Loss
Part Loss
Down Time (HH:MM:SS)
Occurrence
Tool Change
Waiting Attention
Repair in Progress
Shutdown
E-Stop
Set-up
00:00:00
47:45:14
10:52:05
28:30:20
10:28:55
00:00:40
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72
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2
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Page 1 of 2 0 words
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26/03/2018

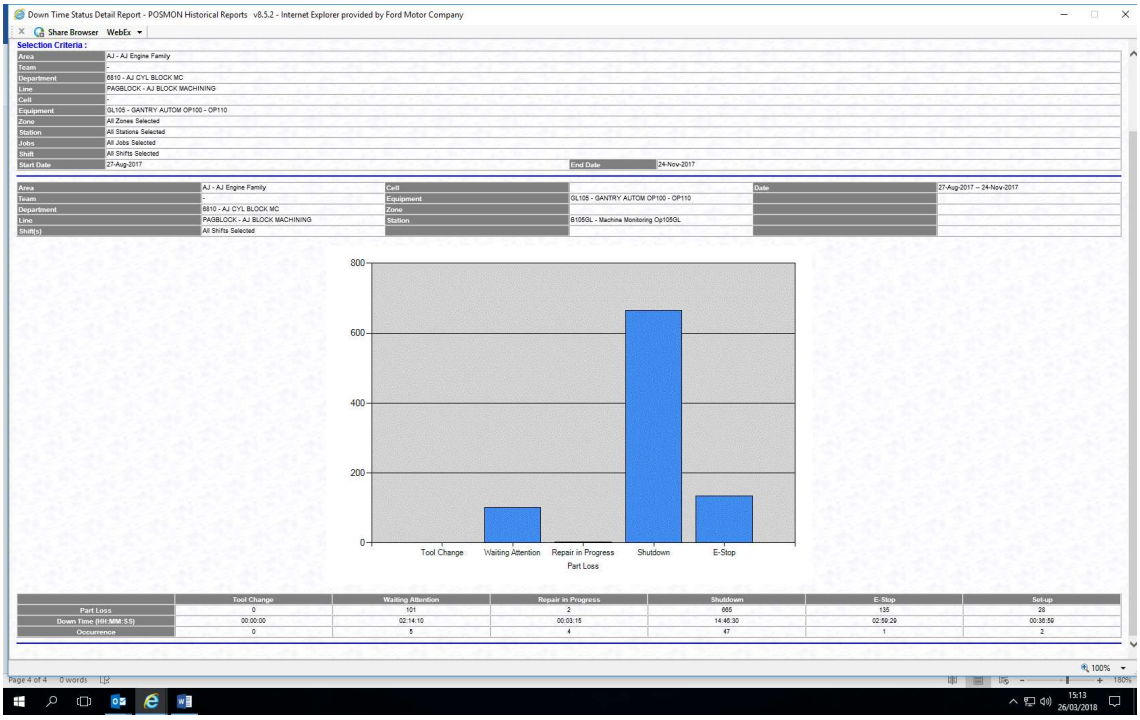

Down Time Status Detail Report - POSMON Historical Reports v8.5.2 - Internet Explorer provided by Ford Motor Company
Share Browser WebEx
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Team -
Department 6810 - AJ CYL BLOCK MC
Line PAGBLOCK - AJ BLOCK MACHINING
Cell -
Equipment GL067 - GANTRY LOAD OP067
Zone All Zones Selected
Station All Stations Selected
Jobs All Jobs Selected
Shift All Shifts Selected
Start Date 27-Aug-2017
End Date 24-Nov-2017
Area AJ - AJ Engine Family
Team -
Department 6810 - AJ CYL BLOCK MC
Line PAGBLOCK - AJ BLOCK MACHINING
Shift(s) All Shifts Selected
Cell
Equipment GL067 - GANTRY LOAD OP067
Zone
Station B067GL - Machine Monitoring Op67GL
Date 27-Aug-2017 – 24-Nov-2017
1400
1200
1000
800
600
400
200
0
Tool Change
Waiting Attention
Repair in Progress
Shutdown
E-Stop
Part Loss
Part Loss
Down Time (HH:MM:SS)
Occurrence
Tool Change
Waiting Attention
Repair in Progress
Shutdown
E-Stop
Set-up
0
1222
133
625
15
778
00:00:00
27:08:50
02:56:50
13:53:32
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26/03/2018

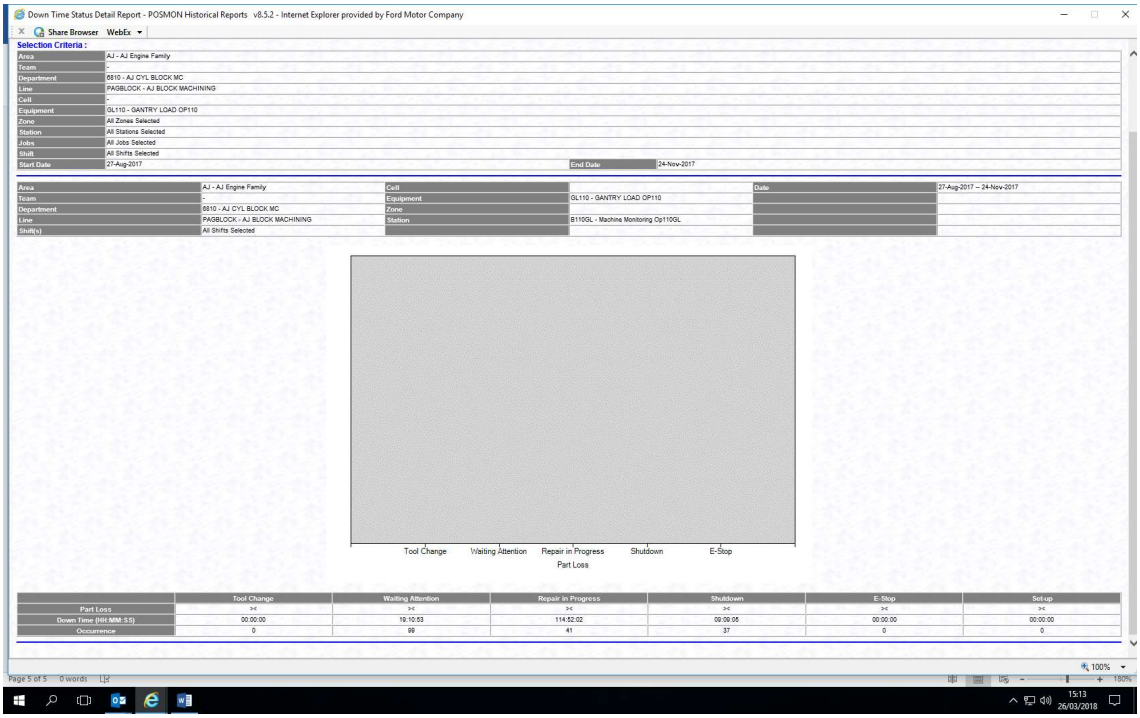

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Team -
Department 6810 - AJ CYL BLOCK MC
Line PAGBLOCK - AJ BLOCK MACHINING
Cell -
Equipment GL068 - GANTRY LOAD Op68
Zone All Zones Selected
Station All Stations Selected
Jobs All Jobs Selected
Shift All Shifts Selected
Start Date 27-Aug-2017
End Date 24-Nov-2017
Area AJ - AJ Engine Family
Team -
Department 6810 - AJ CYL BLOCK MC
Line PAGBLOCK - AJ BLOCK MACHINING
Shift(s) All Shifts Selected
Cell
Equipment GL068 - GANTRY LOAD Op68
Zone
Station B0680L - Machine Monitoring Op680L
Date 27-Aug-2017 -- 24-Nov-2017
2500
2000
1500
1000
500
0
Tool Change
Waiting Attention
Repair in Progress
Shutdown
E-Stop
Part Loss
Tool Change Waiting Attention Repair in Progress Shutdown E-Stop Set-up
Part Loss 0 918 35 2280 19 0
Down Time (HH:MM:SS) 00:00:00 20:21:27 00:47:07 50:30:50 00:25:54 00:00:00
Occurrence 0 171 23 287 5 0
15:11
26/03/2018

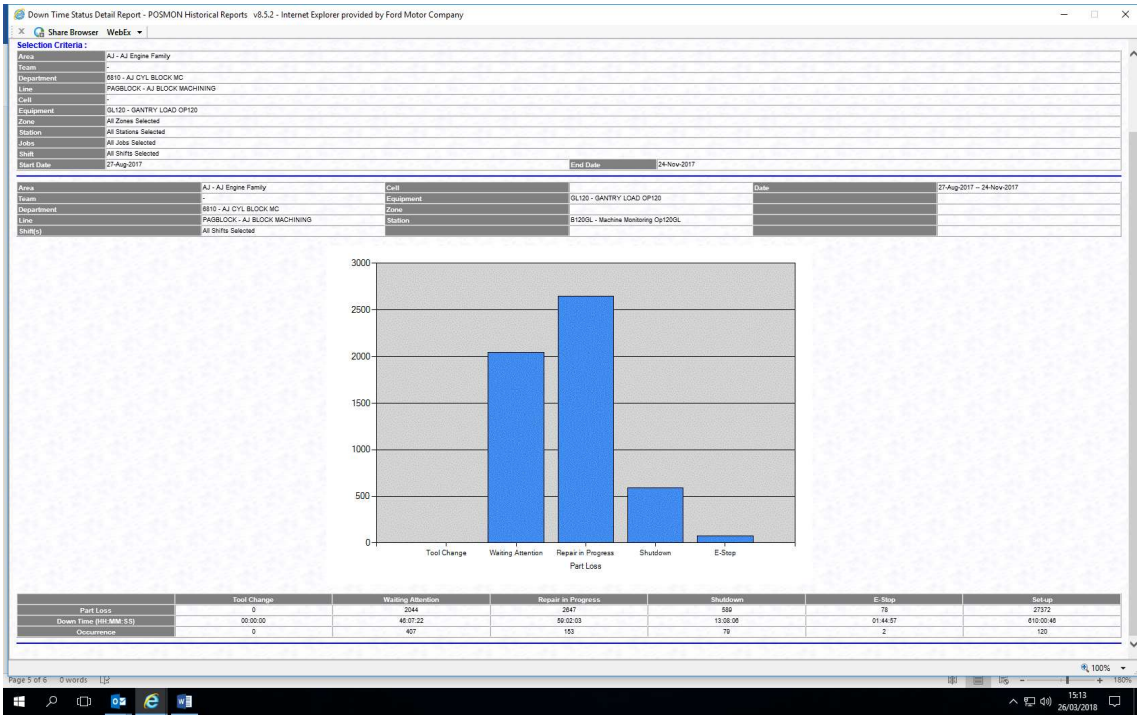

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Selection Criteria :
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Team -
Department 6810 - AJ CYL BLOCK MC
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Cell -
Equipment GL070 - GANTRY LOAD OP070
Zone All Zones Selected
Station All Stations Selected
Jobs All Jobs Selected
Shift All Shifts Selected
Start Date 27-Aug-2017
End Date 24-Nov-2017
Area AJ - AJ Engine Family
Team -
Department 6810 - AJ CYL BLOCK MC
Line PAGBLOCK - AJ BLOCK MACHINING
Shift(s) All Shifts Selected
Cell
Equipment GL070 - GANTRY LOAD OP070
Zone
Station B0700L - Machine Monitoring Op700L
Date 27-Aug-2017 -- 24-Nov-2017
3000
2500
2000
1500
1000
500
0
Tool Change
Waiting Attention
Repair in Progress
Shutdown
E-Stop
Part Loss
Tool Change Waiting Attention Repair in Progress Shutdown E-Stop Set-up
Part Loss 0 2617 2906 157 1 27114
Down Time (HH:MM:SS) 00:00:00 58:24:22 67:53:12 03:26:40 00:01:25 604:03:54
Occurrence 0 472 258 66 2 120
15:11
26/03/2018


Down Time Status Detail Report - POSMON Historical Reports v8.5.2 - Internet Explorer provided by Ford Motor Company
Share Browser WebEx
Selection Criteria :
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Team -
Department 6810 - AJ CYL BLOCK MC
Line PAGBLOCK - AJ BLOCK MACHINING
Cell -
Equipment GL080 - GANTRY LOAD OP080
Zone All Zones Selected
Station All Stations Selected
Jobs All Jobs Selected
Shift All Shifts Selected
Start Date 27-Aug-2017
End Date 24-Nov-2017
Area AJ - AJ Engine Family
Team -
Department 6810 - AJ CYL BLOCK MC
Line PAGBLOCK - AJ BLOCK MACHINING
Shift(s) All Shifts Selected
Cell
Equipment GL080 - GANTRY LOAD OP080
Zone
Station B080GL - Machine Monitoring Op80GL
Date 27-Aug-2017 – 24-Nov-2017
Tool Change
Waiting Attention
Repair in Progress
Shutdown
E-Stop
Part Loss
Part Loss 0 0 0 0 0 0
Down Time (HH:MM:SS) 00:00:00 00:00:00 00:00:00 00:00:00 00:00:00 00:00:00
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26/03/2018

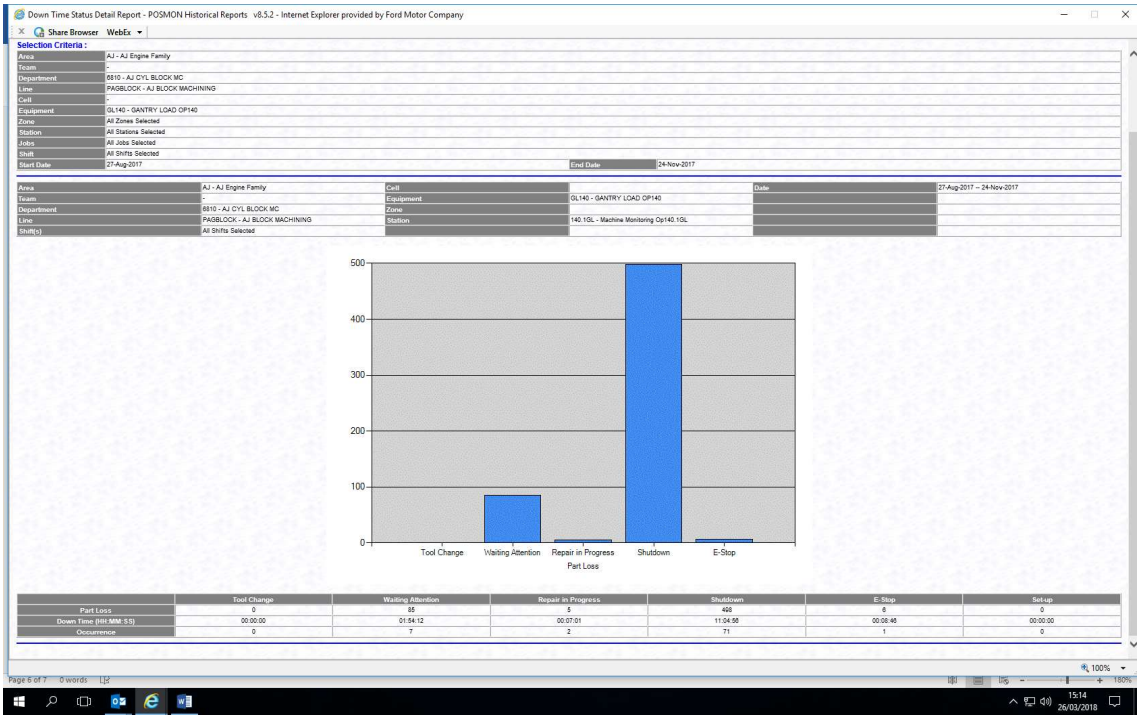

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Share Browser WebEx
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Team -
Department 6810 - AJ CYL BLOCK MC
Line PAGBLOCK - AJ BLOCK MACHINING
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Equipment GL100 - GANTRY LOAD OP100
Zone All Zones Selected
Station All Stations Selected
Jobs All Jobs Selected
Shift All Shifts Selected
Start Date 27-Aug-2017
End Date 24-Nov-2017
Area AJ - AJ Engine Family
Team -
Department 6810 - AJ CYL BLOCK MC
Line PAGBLOCK - AJ BLOCK MACHINING
Shift(s) All Shifts Selected
Cell
Equipment GL100 - GANTRY LOAD OP100
Zone
Station B100GL - Machine Monitoring Op100GL
Date 27-Aug-2017 – 24-Nov-2017
10000
8000
6000
4000
2000
0
Tool Change
Waiting Attention
Repair in Progress
Shutdown
E-Stop
Part Loss
Part Loss 0 3839 9382 1886 0 8868
Down Time (HH:MM:SS) 00:00:00 85:35:20 209:13:07 42:03:00 00:00:00 200:26:30
Occurrence 0 703 149 63 0 87
Page 4 of 4 0 words
100%
15:12
26/03/2018

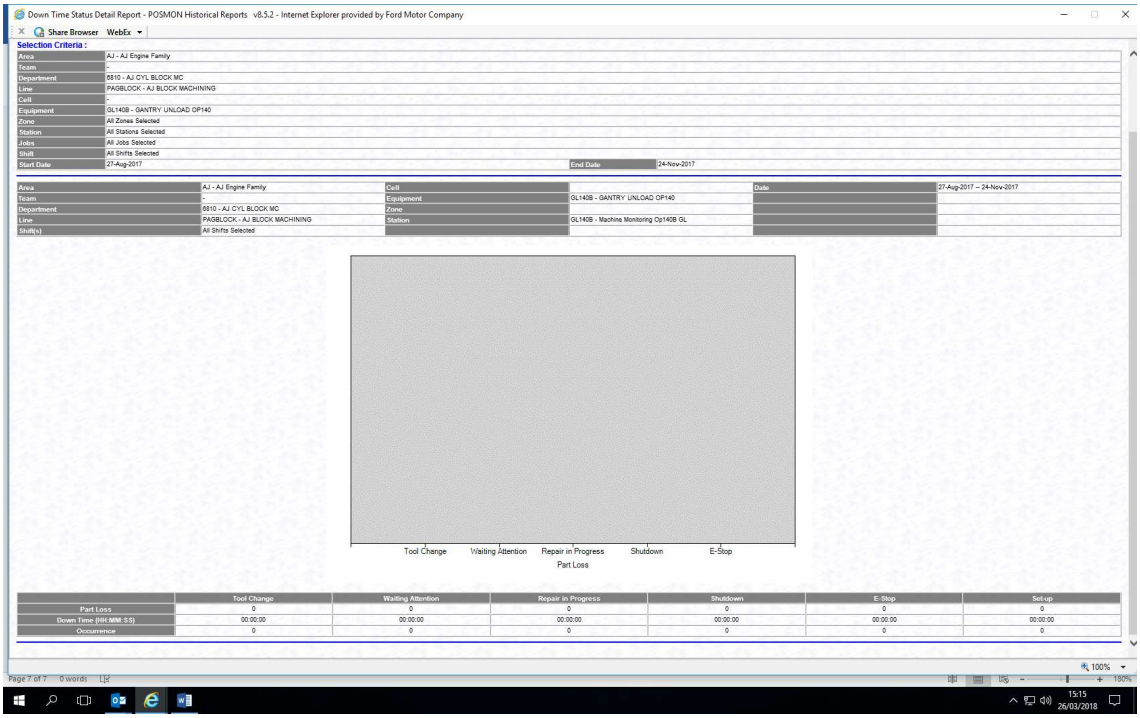

Down Time Status Detail Report - POSMON Historical Reports v8.5.2 - Internet Explorer provided by Ford Motor Company
Share Browser WebEx
Selection Criteria :
Area AJ - AJ Engine Family
Team -
Department 6810 - AJ CYL BLOCK MC
Line PAGBLOCK - AJ BLOCK MACHINING
Cell -
Equipment GL105 - GANTRY AUTOM OP100 - OP110
Zone All Zones Selected
Station All Stations Selected
Jobs All Jobs Selected
Shift All Shifts Selected
Start Date 27-Aug-2017
End Date 24-Nov-2017
Area AJ - AJ Engine Family
Team -
Department 6810 - AJ CYL BLOCK MC
Line PAGBLOCK - AJ BLOCK MACHINING
Shift(s) All Shifts Selected
Cell
Equipment GL105 - GANTRY AUTOM OP100 - OP110
Zone
Station B1050L - Machine Monitoring Op105GL
Date 27-Aug-2017 – 24-Nov-2017
800
600
400
200
0
Tool Change
Waiting Attention
Repair in Progress
Shutdown
E-Stop
Part Loss
Tool Change Waiting Attention Repair in Progress Shutdown E-Stop Set-up
Part Loss 0 101 2 665 135 28
Down Time (HH:MM:SS) 00:00:00 02:14:10 00:03:15 14:46:30 02:59:29 00:36:59
Occurrence 0 5 4 47 1 2
100%
Page 4 of 4 0 words
15:13
26/03/2018

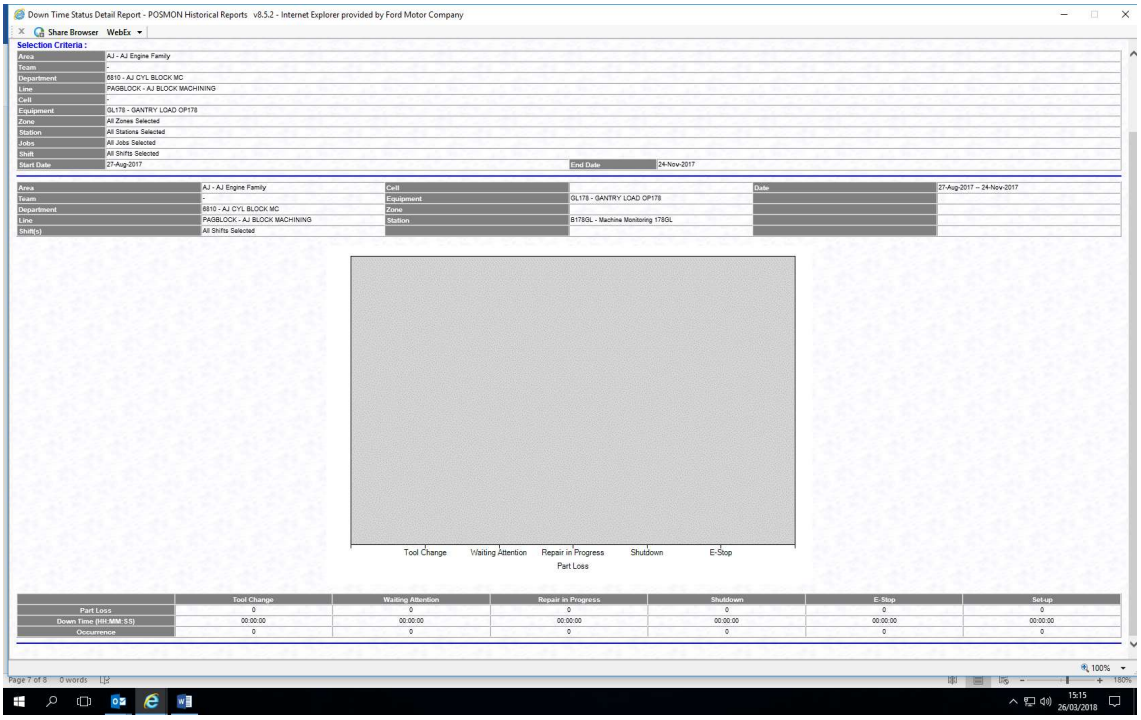

Down Time Status Detail Report - POSMON Historical Reports v8.5.2 - Internet Explorer provided by Ford Motor Company
Share Browser WebEx
Selection Criteria :
Area AJ - AJ Engine Family
Team -
Department 6810 - AJ CYL BLOCK MC
Line PAGBLOCK - AJ BLOCK MACHINING
Cell -
Equipment GL110 - GANTRY LOAD OP110
Zone All Zones Selected
Station All Stations Selected
Jobs All Jobs Selected
Shift All Shifts Selected
Start Date 27-Aug-2017
End Date 24-Nov-2017
Area AJ - AJ Engine Family
Team -
Department 6810 - AJ CYL BLOCK MC
Line PAGBLOCK - AJ BLOCK MACHINING
Shift(s) All Shifts Selected
Cell
Equipment GL110 - GANTRY LOAD OP110
Zone
Station B1100L - Machine Monitoring Op110GL
Date 27-Aug-2017 – 24-Nov-2017
Tool Change
Waiting Attention
Repair in Progress
Shutdown
E-Stop
Part Loss
Tool Change Waiting Attention Repair in Progress Shutdown E-Stop Set-up
Part Loss >< >< >< >< >< ><
Down Time (HH:MM:SS) 00:00:00 16:10:53 114:52:02 09:09:05 00:00:00 00:00:00
Occurrence 0 99 41 37 0 0
100%
Page 5 of 5 0 words
15:13
26/03/2018


Down Time Status Detail Report - POSMON Historical Reports v8.5.2 - Internet Explorer provided by Ford Motor Company
Share Browser WebEx
Selection Criteria :
Area AJ - AJ Engine Family
Team -
Department 6810 - AJ CYL BLOCK MC
Line PAGBLOCK - AJ BLOCK MACHINING
Cell -
Equipment GL120 - GANTRY LOAD OP120
Zone All Zones Selected
Station All Stations Selected
Jobs All Jobs Selected
Shift All Shifts Selected
Start Date 27-Aug-2017
End Date 24-Nov-2017
Area AJ - AJ Engine Family
Team -
Department 6810 - AJ CYL BLOCK MC
Line PAGBLOCK - AJ BLOCK MACHINING
Shift(s) All Shifts Selected
Cell
Equipment GL120 - GANTRY LOAD OP120
Zone
Station B120GL - Machine Monitoring Op120GL
Date 27-Aug-2017 – 24-Nov-2017
3000
2500
2000
1500
1000
500
0
Tool Change
Waiting Attention
Repair in Progress
Shutdown
E-Stop
Part Loss
Tool Change Waiting Attention Repair in Progress Shutdown E-Stop Set-up
Part Loss 0 2044 2647 589 78 27372
Down Time (HH:MM:SS) 00:00:00 46:07:22 59:02:03 13:06:06 01:44:57 610:00:46
Occurrence 0 407 153 79 2 120
100%
15:13
26/03/2018


Down Time Status Detail Report - POSMON Historical Reports v8.5.2 - Internet Explorer provided by Ford Motor Company
Share Browser WebEx
Selection Criteria :
Area AJ - AJ Engine Family
Team -
Department 6810 - AJ CYL BLOCK MC
Line PAGBLOCK - AJ BLOCK MACHINING
Cell -
Equipment GL130 - GANTRY LOAD OP130
Zone All Zones Selected
Station All Stations Selected
Jobs All Jobs Selected
Shift All Shifts Selected
Start Date 27-Aug-2017
End Date 24-Nov-2017
Area AJ - AJ Engine Family
Team -
Department 6810 - AJ CYL BLOCK MC
Line PAGBLOCK - AJ BLOCK MACHINING
Shift(s) All Shifts Selected
Cell
Equipment GL130 - GANTRY LOAD OP130
Zone
Station B130GL - Machine Monitoring Op130GL
Date 27-Aug-2017 – 24-Nov-2017
3500
3000
2500
2000
1500
1000
500
0
Tool Change
Waiting Attention
Repair in Progress
Shutdown
E-Stop
Part Loss
Tool Change Waiting Attention Repair in Progress Shutdown E-Stop Set-up
Part Loss 0 735 1087 3498 0 10579
Down Time (HH:MM:SS) 00:00:00 16:21:11 24:09:05 77:47:37 00:00:00 235:14:31
Occurrence 0 276 111 458 0 15
100%
15:14
26/03/2018


Down Time Status Detail Report - POSMON Historical Reports v8.5.2 - Internet Explorer provided by Ford Motor Company
Share Browser WebEx
Selection Criteria :
Area AJ - AJ Engine Family
Team -
Department 6810 - AJ CYL BLOCK MC
Line PAGBLOCK - AJ BLOCK MACHINING
Cell -
Equipment GL140 - GANTRY LOAD OP140
Zone All Zones Selected
Station All Stations Selected
Jobs All Jobs Selected
Shift All Shifts Selected
Start Date 27-Aug-2017
End Date 24-Nov-2017
Area AJ - AJ Engine Family
Team -
Department 6810 - AJ CYL BLOCK MC
Line PAGBLOCK - AJ BLOCK MACHINING
Shift(s) All Shifts Selected
Cell
Equipment GL140 - GANTRY LOAD OP140
Zone
Station 140.1GL - Machine Monitoring Op140.1GL
Date 27-Aug-2017 – 24-Nov-2017
500
400
300
200
100
0
Tool Change
Waiting Attention
Repair in Progress
Shutdown
E-Stop
Part Loss
Tool Change Waiting Attention Repair in Progress Shutdown E-Stop Set-up
Part Loss 0 85 5 498 6 0
Down Time (HH:MM:SS) 00:00:00 01:54:12 00:07:01 11:04:56 00:08:46 00:00:00
Occurrence 0 7 2 71 1 0
Page 6 of 7 0 words
100%
15:14
26/03/2018


Down Time Status Detail Report - POSMON Historical Reports v8.5.2 - Internet Explorer provided by Ford Motor Company
Share Browser WebEx
Selection Criteria :
Area AJ - AJ Engine Family
Team -
Department 6810 - AJ CYL BLOCK MC
Line PAGBLOCK - AJ BLOCK MACHINING
Cell -
Equipment GL140B - GANTRY UNLOAD OP140
Zone All Zones Selected
Station All Stations Selected
Jobs All Jobs Selected
Shift All Shifts Selected
Start Date 27-Aug-2017
End Date 24-Nov-2017
Area AJ - AJ Engine Family
Team -
Department 6810 - AJ CYL BLOCK MC
Line PAGBLOCK - AJ BLOCK MACHINING
Shift(s) All Shifts Selected
Cell
Equipment GL140B - GANTRY UNLOAD OP140
Zone
Station GL140B - Machine Monitoring Op140B GL
Date 27-Aug-2017 – 24-Nov-2017
Tool Change
Waiting Attention
Repair in Progress
Shutdown
E-Stop
Part Loss
Tool Change Waiting Attention Repair in Progress Shutdown E-Stop Set-up
Part Loss 0 0 0 0 0 0
Down Time (HH:MM:SS) 00:00:00 00:00:00 00:00:00 00:00:00 00:00:00 00:00:00
Occurrence 0 0 0 0 0 0
Page 7 of 7 0 words
100%
15:15
26/03/2018



Down Time Status Detail Report - POSMON Historical Reports v8.5.2 - Internet Explorer provided by Ford Motor Company

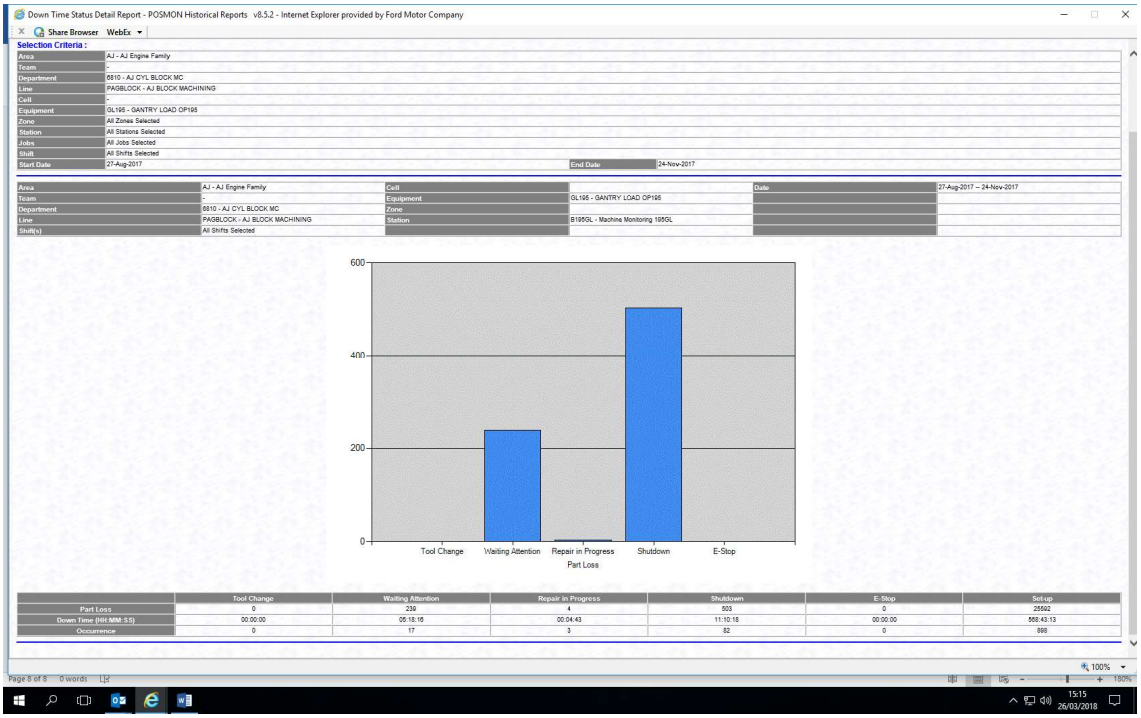
Share Browser WebEx

Selection Criteria :

Area	AJ - AJ Engine Family
Team	-
Department	6810 - AJ CYL BLOCK MC
Line	PAGBLOCK - AJ BLOCK MACHINING
Cell	-
Equipment	GL178 - GANTRY LOAD OP178
Zone	All Zones Selected
Station	All Stations Selected
Jobs	All Jobs Selected
Shift	All Shifts Selected
Start Date	27-Aug-2017
End Date	24-Nov-2017

Area	AJ - AJ Engine Family	Cell		Date	27-Aug-2017 – 24-Nov-2017
Team	-	Equipment	GL178 - GANTRY LOAD OP178		
Department	6810 - AJ CYL BLOCK MC	Zone			
Line	PAGBLOCK - AJ BLOCK MACHINING	Station	B178GL - Machine Monitoring 178GL		
Shift(s)	All Shifts Selected				

	Tool Change	Waiting Attention	Repair in Progress	Shutdown	E-Stop	Set-up
Part Loss	0	0	0	0	0	0
Down Time (HH:MM:SS)	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00
Occurrence	0	0	0	0	0	0



Down Time Status Detail Report - POSMON Historical Reports v8.5.2 - Internet Explorer provided by Ford Motor Company

Share Browser WebEx

Selection Criteria :

Area	AJ - AJ Engine Family
Team	-
Department	6810 - AJ CYL BLOCK MC
Line	PAGBLOCK - AJ BLOCK MACHINING
Cell	-
Equipment	GL195 - GANTRY LOAD OP195
Zone	All Zones Selected
Station	All Stations Selected
Jobs	All Jobs Selected
Shift	All Shifts Selected
Start Date	27-Aug-2017
End Date	24-Nov-2017

Area	AJ - AJ Engine Family	Cell		Date	27-Aug-2017 – 24-Nov-2017
Team	-	Equipment	GL195 - GANTRY LOAD OP195		
Department	6810 - AJ CYL BLOCK MC	Zone			
Line	PAGBLOCK - AJ BLOCK MACHINING	Station	B195GL - Machine Monitoring 195GL		
Shift(s)	All Shifts Selected				

	Tool Change	Waiting Attention	Repair in Progress	Shutdown	E-Stop	Set-up
Part Loss	0	239	4	503	0	25592
Down Time (HH:MM:SS)	00:00:00	05:16:16	00:04:43	11:10:18	00:00:00	568:43:13
Occurrence	0	17	3	82	0	898

12.10 Appendix 10

Gantry	Tool Change Part loss	Waiting attention Part loss	Repair Part Loss	Shutdown Part Loss	E-Stop Part Loss	Setup Part Loss	Tool Change Duration	Waiting Attention Duration	Repair Duration	Shutdown Duration	E-Stop Duration	Setup Duration	Tool Change Occurance	Gantry	Waiting Attention Occurance	Repair Occurance	Shutdown Occurance	E-Stop Occurance	Setup Occurance
GL015	0	257	240	512	80	0	0:00:00	3:00:05	2:47:54	5:57:51	0:56:11	0:00:00	0	GL015	27	14	44	5	0
GL340	0	1448	416	651	5	626	0:00:00	72:25:00	20:48:59	32:33:08	0:14:37	31:17:37	0	GL340	545	308	229	4	30
GL350/360	><	><	><	><	><	><	0:00:00	47:45:14	10:52:05	25:30:20	10:28:55	0:00:40	0	GL350/360	336	72	233	7	2
GL067	0	1222	133	625	15	778	0:00:00	27:08:50	2:56:50	13:53:32	0:19:49	17:17:42	0	GL067	104	19	153	3	7
GL068	0	916	35	2280	19	0	0:00:00	20:21:27	0:47:07	50:39:50	0:25:54	0:00:00	0	GL068	171	23	287	5	0
GL070	0	2617	2906	157	1	27114	0:00:00	58:24:22	67:53:12	3:29:40	0:01:25	604:03:54	0	GL070	472	256	98	2	120
GL080	0	0	0	0	0	0	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0	GL080	0	0	0	0	0
GL100	0	3839	9382	1836	0	0	0:00:00	85:36:29	209:12:07	42:03:00	0:00:00	200:26:30	0	GL100	703	149	63	0	87
GL105	0	101	2	665	135	28	0:00:00	2:14:10	0:03:15	14:46:30	2:59:29	0:36:59	0	GL105	5	4	47	1	2
GL110	><	><	><	><	><	><	0:00:00	19:10:53	114:52:02	9:09:05	0:00:00	0:00:00	0	GL110	99	41	37	0	0
GL120	0	2044	2647	539	78	27372	0:00:00	46:07:22	59:02:03	13:08:06	1:44:57	610:00:46	0	GL120	407	153	79	2	120
GL130	0	735	1087	3493	0	10579	0:00:00	16:21:11	24:09:05	77:47:37	0:00:00	235:14:31	0	GL130	276	11	458	0	15
GL140	0	85	5	498	6	0	0:00:00	1:54:12	1:07:01	11:04:56	0:08:46	0:00:00	0	GL140	7	2	71	1	0
GL140B	0	0	0	0	0	0	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0	GL140B	0	0	0	0	0
GL178	0	0	0	0	0	0	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0	GL178	0	0	0	0	0
GL195	0	239	4	503	0	25592	0:00:00	5:18:16	0:04:43	11:10:18	0:00:00	568:43:13	0	GL195	17	3	82	0	898
	0	13603	16857	11759	339	92089	0:00:00	406:47:31	514:36:23	311:13:53	17:20:03	2267:41:52	0		3169	1055	1881	30	1281
								1.18							198	66	118		

Waiting Attention Occurance	3169	42.73	42.73
Shutdown Occurance	1881	25.36	68.09
Setup Occurance	1281	17.27	85.36
Repair Occurance	1055	14.23	99.59
E-Stop Occurance	30	0.4	99.99
	7416	99.99	

POS Monitoring Date : 04-Jan-2017
Bridgend Engine Plant Time : 13:46:57

Equipment Fault Detail Report

Selection Criteria :

Area	AJ - AJ Engine Family
Team	-
Department	6810 - AJ CYL BLOCK MC
Line	PAGBLOCK - AJ BLOCK MACHINING
Cell	-
Equipment	GL015 - GANTRY LOAD OP10 # GL020 - GANTRY LOAD OP20 # GL030 - GANTRY LOAD OP30/360 # GL057 - GANTRY LOAD OP057 # GL058 - GANTRY LOAD Op58 # GL070 - GANTRY LOAD OP070 # GL080 - GANTRY LOAD OP080 # GL100 - GANTRY LOAD OP100 # GL105 - GANTRY AUTOM OP100 - OP110 # GL110 - GANTRY LOAD OP110 # GL120 - GANTRY LOAD OP120 # GL130 - GANTRY LOAD OP130 # GL140 - GANTRY LOAD OP140 # GL140B - GANTRY UNLOAD OP140 # GL178 - GANTRY LOAD OP178 # GL195 - GANTRY LOAD OP195
Zone	All Zones Selected
Station	All Stations Selected
Jobs	All Jobs Selected
Shift	1 - Earlies # 2 - Lates # 3 - Nights
Start Date	27-Aug-17 End Date 24-Nov-17
Faults/Stoppages	Stoppages Only

Area	AJ - AJ Engine Family	Cell		Date	27-Aug-2017 – 24-Nov-2017
Team	-	Equipment			
Department	6810 - AJ CYL BLOCK MC	Zone			
Line	PAGBLOCK - AJ BLOCK MACHINING	Station			
Shift(s)	1 - Earlies # 2 - Lates # 3 - Nights	Faults/Stoppages	Stoppages Only		

Equipment	Station	Facility Text	Job ID	Word 1	Word 2	Word 3	Fault Description	Rsn Code	Rsn Desc	Start Time	End Time	Duration(HH:MM:SS)
GL015	B015GL	OP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		29-08-2017 7:57	29-08-2017 8:04	0:06:29
GL015	B015GL	OP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		29-08-2017 11:01	29-08-2017 11:07	0:06:24
GL015	B015GL	OP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		29-08-2017 11:10	29-08-2017 11:12	0:02:32
GL015	B015GL	OP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		29-08-2017 11:37	29-08-2017 11:46	0:08:32
GL015	B015GL	OP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		30-08-2017 23:03	30-08-2017 23:17	0:14:06
GL015	B015GL	OP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		31-08-2017 0:44	31-08-2017 1:44	0:59:55
GL015	B015GL	OP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		06-09-2017 16:18	06-09-2017 16:24	0:06:12
GL015	B015GL	OP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		08-09-2017 20:40	08-09-2017 20:50	0:10:43
GL015	B015GL	OP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		14-09-2017 5:39	14-09-2017 6:21	0:41:29
GL015	B015GL	OP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		16-09-2017 23:23	16-09-2017 23:35	0:12:26
GL015	B015GL	OP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		17-09-2017 20:36	17-09-2017 20:47	0:11:26
GL015	B015GL	OP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		18-09-2017 14:58	18-09-2017 14:58	0:00:06
GL015	B015GL	OP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		18-09-2017 18:12	18-09-2017 18:27	0:14:43
GL015	B015GL	OP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		25-09-2017 18:53	25-09-2017 18:56	0:02:23
GL015	B015GL	OP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		25-09-2017 18:57	25-09-2017 18:59	0:02:06
GL015	B015GL	OP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		25-09-2017 19:04	25-09-2017 19:04	0:00:07
GL015	B015GL	OP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		25-09-2017 19:54	25-09-2017 19:55	0:01:07
GL015	B015GL	OP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		25-09-2017 19:55	25-09-2017 19:55	0:00:02
GL015	B015GL	OP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		26-09-2017 6:05	26-09-2017 6:06	0:00:01
GL015	B015GL	OP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		26-09-2017 6:07	26-09-2017 6:14	0:06:14
GL015	B015GL	OP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		26-09-2017 6:40	26-09-2017 6:47	0:06:07
GL015	B015GL	OP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		07-10-2017 9:00	07-10-2017 9:02	0:02:27
GL015	B015GL	OP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		07-10-2017 11:03	07-10-2017 11:05	0:01:50
GL015	B015GL	OP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		07-10-2017 11:16	07-10-2017 11:16	0:00:10
GL015	B015GL	OP15-17GL	13 - AJ133 Parts	0	0	9	Manual Event - Shutdown	0		07-10-2017 11:33	07-10-2017 11:33	0:00:21

GL015	B015GL	QP15-17GL	13 - AJ133 Pairs	0	0	9	Manual Event - Shutdown	0		07-10-2017 11:41			0:00:39
GL015	B015GL	QP15-17GL	13 - AJ133 Pairs	0	0	9	Manual Event - Shutdown	0		07-10-2017 11:43	07-10-2017 11:44		0:00:18
GL015	B015GL	QP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		01-11-2017 4:45	01-11-2017 4:45		0:00:07
GL015	B015GL	QP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		11-11-2017 5:35	11-11-2017 5:35		0:00:07
GL015	B015GL	QP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		13-11-2017 15:05	13-11-2017 15:05		0:00:07
GL015	B015GL	QP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		16-11-2017 9:36	16-11-2017 9:36		0:00:12
GL015	B015GL	QP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		20-11-2017 14:38	20-11-2017 14:43		0:04:50
GL015	B015GL	QP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		20-11-2017 22:23	20-11-2017 22:28		0:05:40
GL015	B015GL	QP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		21-11-2017 1:05	21-11-2017 1:10		0:05:12
GL015	B015GL	QP15-17GL	12 - PAG Gantry	0	0	9	Manual Event - Shutdown	0		22-11-2017 0:14	22-11-2017 0:16		0:01:49
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		29-08-2017 18:19	29-08-2017 18:29		0:00:09
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		01-09-2017 9:25	01-09-2017 9:25		0:00:54
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		01-09-2017 9:30	01-09-2017 9:30		0:00:11
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		02-09-2017 4:38	02-09-2017 4:38		0:00:11
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		02-09-2017 10:33	02-09-2017 10:36		0:03:35
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		10-09-2017 22:52	10-09-2017 22:52		0:00:19
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		13-09-2017 2:05	13-09-2017 2:05		0:00:12
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		13-09-2017 19:02	13-09-2017 19:02		0:00:14
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		14-09-2017 14:37	14-09-2017 14:38		0:00:09
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		16-09-2017 8:14	16-09-2017 8:14		0:00:10
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		21-09-2017 9:00	21-09-2017 9:29		0:28:49
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		22-09-2017 8:12	22-09-2017 8:13		0:01:00
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		22-09-2017 8:34	22-09-2017 8:35		0:00:40
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		22-09-2017 8:36	22-09-2017 8:37		0:00:54
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		22-09-2017 12:41	22-09-2017 16:48		3:06:54
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		24-09-2017 23:41	24-09-2017 23:41		0:00:10
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		25-09-2017 3:15	25-09-2017 3:15		0:00:11
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		25-09-2017 17:43	25-09-2017 17:44		0:00:14
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		25-09-2017 22:39	25-09-2017 22:39		0:00:16
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		26-09-2017 19:27	26-09-2017 19:27		0:00:31
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		27-09-2017 7:19	27-09-2017 7:19		0:00:09
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		23-09-2017 16:28	23-09-2017 16:31		0:02:45
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		27-09-2017 17:10	27-09-2017 17:10		0:00:12
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		27-09-2017 17:13	27-09-2017 17:19		0:06:59
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		27-09-2017 17:21	27-09-2017 17:28		0:06:51
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		27-09-2017 21:46	27-09-2017 22:18		0:32:48
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		28-09-2017 18:59	28-09-2017 19:01		0:01:53
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		01-10-2017 11:20	01-10-2017 11:23		0:00:23
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		01-10-2017 14:46	01-10-2017 14:53		0:07:26
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		01-10-2017 14:54	01-10-2017 14:55		0:01:34
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		01-10-2017 14:56	01-10-2017 15:03		0:07:01
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		01-10-2017 15:03	01-10-2017 15:13		0:10:10
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		01-10-2017 15:14	01-10-2017 15:26		0:11:38
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		01-10-2017 16:46	02-10-2017 7:01		14:14:57
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		02-10-2017 15:37	02-10-2017 15:37		0:00:12
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		03-10-2017 16:28	03-10-2017 16:29		0:02:01
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		03-10-2017 22:45	04-10-2017 2:44		3:59:00
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		04-10-2017 4:43	04-10-2017 5:19		0:36:42
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		04-10-2017 5:19	04-10-2017 6:13		0:53:11
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		04-10-2017 6:16	04-10-2017 6:20		0:04:34
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		04-10-2017 10:18	04-10-2017 10:21		0:03:03
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		04-10-2017 23:43	04-10-2017 23:43		0:00:12
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		05-10-2017 23:56	06-10-2017 0:06		0:10:12
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		06-10-2017 2:16	06-10-2017 2:28		0:11:44
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		07-10-2017 23:47	07-10-2017 23:47		0:00:12
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		09-10-2017 8:23	09-10-2017 10:23		1:59:58
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		09-10-2017 12:54	09-10-2017 12:56		0:01:53
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		09-10-2017 12:07	09-10-2017 12:09		0:01:17
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		09-10-2017 12:10	09-10-2017 12:17		0:07:00
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		09-10-2017 14:34	09-10-2017 14:34		0:00:12
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		09-10-2017 15:00	09-10-2017 15:00		0:00:19
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		11-10-2017 5:32	11-10-2017 5:32		0:00:16
GL340	B340GL	330_3600L	40 - AJ133 N/A	0	0	9	Manual Event - Shutdown	0		11-10-2017 5:37	11-10-2017 5:37		0:00:29

GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			11-10-2017 10:53	11-10-2017 10:53	0:00:23
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			12-10-2017 3:47	12-10-2017 3:47	0:00:09
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			12-10-2017 6:33	12-10-2017 10:35	3:41:26
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			13-10-2017 3:55	13-10-2017 5:06	1:11:16
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			13-10-2017 14:46	13-10-2017 14:46	0:00:22
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			13-10-2017 14:48	13-10-2017 14:49	0:00:29
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			13-10-2017 14:52	13-10-2017 14:53	0:00:42
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			13-10-2017 14:56	13-10-2017 14:56	0:00:03
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			13-10-2017 15:00	13-10-2017 15:01	0:00:11
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			13-10-2017 15:05	13-10-2017 15:06	0:00:28
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			13-10-2017 15:34	13-10-2017 15:34	0:00:32
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			13-10-2017 19:56	13-10-2017 19:56	0:00:29
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			14-10-2017 1:55	14-10-2017 4:59	2:13:15
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			14-10-2017 8:31	14-10-2017 8:32	0:00:10
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			15-10-2017 9:53	15-10-2017 10:12	0:18:33
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			15-10-2017 10:36	15-10-2017 10:36	0:00:14
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			15-10-2017 18:07	15-10-2017 22:11	4:03:15
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			16-10-2017 14:05	16-10-2017 22:23	8:18:37
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			17-10-2017 13:21	17-10-2017 13:21	0:00:11
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			18-10-2017 10:30	18-10-2017 10:30	0:00:24
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			18-10-2017 15:33	18-10-2017 15:33	0:00:34
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			18-11-2017 23:15	18-11-2017 23:15	0:00:14
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			18-11-2017 23:29	18-11-2017 23:29	0:00:47
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			19-11-2017 4:04	19-11-2017 4:04	0:00:01
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			19-11-2017 4:21	19-11-2017 4:21	0:00:17
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			19-11-2017 16:44	19-11-2017 16:44	0:01:28
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			19-11-2017 20:57	19-11-2017 20:57	0:00:37
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			19-11-2017 21:23	19-11-2017 21:23	0:00:43
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			20-11-2017 0:23	20-11-2017 0:23	0:00:28
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			20-11-2017 1:27	20-11-2017 1:27	0:00:19
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			20-11-2017 1:31	20-11-2017 1:32	0:00:36
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			20-11-2017 1:34	20-11-2017 1:35	0:00:49
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			20-11-2017 1:43	20-11-2017 1:43	0:00:17
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			20-11-2017 10:51	20-11-2017 10:51	0:00:10
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			20-11-2017 20:37	20-11-2017 20:38	0:00:11
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			20-11-2017 20:48	20-11-2017 20:48	0:00:18
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			21-11-2017 23:33	21-11-2017 23:33	0:00:17
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			22-11-2017 10:19	22-11-2017 10:20	0:00:57
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			22-11-2017 11:34	22-11-2017 11:34	0:00:38
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			22-11-2017 14:41	22-11-2017 14:43	0:00:45
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			23-11-2017 15:13	23-11-2017 15:13	0:00:01
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			23-11-2017 6:45	23-11-2017 6:45	0:00:14
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			23-11-2017 16:32	23-11-2017 16:33	0:00:32
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			23-11-2017 16:38	23-11-2017 16:38	0:00:21
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			24-11-2017 15:08	24-11-2017 15:26	0:18:06
GL340	B340GL	330_3600L	40 - AU133 N/A	0		0	9 Manual Event - Shutdown	0			24-11-2017 15:45	24-11-2017 15:46	0:00:11
GL350-360	350-360GL	GL350-360	0 - N/A	0		0	9 Manual Event - Shutdown	0			26-08-2017 0:12	26-08-2017 0:15	0:02:51
GL350-360	350-360GL	GL350-360	0 - N/A	0		0	9 Manual Event - Shutdown	0			28-08-2017 0:15	28-08-2017 0:18	0:02:18
GL350-360	350-360GL	GL350-360	0 - N/A	0		0	9 Manual Event - Shutdown	0			28-08-2017 0:18	28-08-2017 0:21	0:02:31
GL350-360	350-360GL	GL350-360	0 - N/A	0		0	9 Manual Event - Shutdown	0			28-08-2017 2:56	28-08-2017 2:57	0:00:34
GL350-360	350-360GL	GL350-360	0 - N/A	0		0	9 Manual Event - Shutdown	0			28-08-2017 2:57	28-08-2017 3:03	0:06:00
GL350-360	350-360GL	GL350-360	0 - N/A	0		0	9 Manual Event - Shutdown	0			29-08-2017 11:26	29-08-2017 11:26	0:00:43
GL350-360	350-360GL	GL350-360	0 - N/A	0		0	9 Manual Event - Shutdown	0			29-08-2017 20:51	29-08-2017 20:51	0:00:09
GL350-360	350-360GL	GL350-360	0 - N/A	0		0	9 Manual Event - Shutdown	0			30-08-2017 3:33	30-08-2017 3:33	0:00:15
GL350-360	350-360GL	GL350-360	0 - N/A	0		0	9 Manual Event - Shutdown	0			30-08-2017 6:16	30-08-2017 6:16	0:00:07
GL350-360	350-360GL	GL350-360	0 - N/A	0		0	9 Manual Event - Shutdown	0			30-08-2017 6:19	30-08-2017 6:21	0:01:57
GL350-360	350-360GL	GL350-360	0 - N/A	0		0	9 Manual Event - Shutdown	0			30-08-2017 15:06	30-08-2017 15:09	0:02:56
GL350-360	350-360GL	GL350-360	0 - N/A	0		0	9 Manual Event - Shutdown	0			30-08-2017 15:10	30-08-2017 15:11	0:01:17
GL350-360	350-360GL	GL350-360	0 - N/A	0		0	9 Manual Event - Shutdown	0			30-08-2017 15:12	30-08-2017 15:20	0:07:52
GL350-360	350-360GL	GL350-360	0 - N/A	0		0	9 Manual Event - Shutdown	0			30-08-2017 15:32	30-08-2017 15:42	0:19:35
GL350-360	350-360GL	GL350-360	0 - N/A	0		0	9 Manual Event - Shutdown	0			30-08-2017 17:25	30-08-2017 17:42	0:15:19
GL350-360	350-360GL	GL350-360	0 - N/A	0		0	9 Manual Event - Shutdown	0			30-08-2017 17:43	30-08-2017 17:44	0:01:53
GL350-360	350-360GL	GL350-360	0 - N/A	0		0	9 Manual Event - Shutdown	0			30-08-2017 17:43	30-08-2017 17:44	0:01:07

GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		30-08-2017 17:45	30-08-2017 17:46	0:01:32
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		30-08-2017 17:47	30-08-2017 17:48	0:00:51
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		30-08-2017 17:57	30-08-2017 18:02	0:05:40
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		30-08-2017 18:03	30-08-2017 18:05	0:02:07
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		30-08-2017 18:06	30-08-2017 18:16	0:10:37
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		30-08-2017 18:17	30-08-2017 18:18	0:01:27
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		30-08-2017 20:13	30-08-2017 20:13	0:00:01
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		31-08-2017 12:28	31-08-2017 12:28	0:00:01
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		01-09-2017 14:14	01-09-2017 14:14	0:00:10
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		01-09-2017 22:14	01-09-2017 22:14	0:00:09
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		02-09-2017 17:33	02-09-2017 22:24	4:51:02
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		04-09-2017 21:38	04-09-2017 21:39	0:00:14
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		05-09-2017 12:26	05-09-2017 12:38	0:12:06
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		05-09-2017 12:38	05-09-2017 12:41	0:02:28
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		07-09-2017 12:39	07-09-2017 12:39	0:00:17
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		07-09-2017 15:05	07-09-2017 15:08	0:02:30
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		07-09-2017 15:08	07-09-2017 15:09	0:00:22
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		07-09-2017 19:01	07-09-2017 19:04	0:02:38
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		07-09-2017 19:04	07-09-2017 19:08	0:03:51
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		07-09-2017 19:09	07-09-2017 19:32	0:23:40
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		09-09-2017 21:31	09-09-2017 21:31	0:00:09
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		09-09-2017 22:22	09-09-2017 22:23	0:00:15
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		09-09-2017 22:26	09-09-2017 22:28	0:01:55
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		10-09-2017 6:53	10-09-2017 6:54	0:00:59
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		10-09-2017 13:29	10-09-2017 13:29	0:00:09
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		10-09-2017 18:17	10-09-2017 18:17	0:00:01
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		10-09-2017 18:26	10-09-2017 22:19	3:52:42
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		11-09-2017 12:53	11-09-2017 12:55	0:02:08
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		11-09-2017 12:56	11-09-2017 12:56	0:00:29
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		11-09-2017 12:57	11-09-2017 12:58	0:01:33
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		11-09-2017 12:59	11-09-2017 13:04	0:05:31
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		13-09-2017 14:19	13-09-2017 14:21	0:01:31
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		13-09-2017 14:24	13-09-2017 14:38	0:14:06
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		13-09-2017 14:39	13-09-2017 14:43	0:03:59
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		13-09-2017 21:10	13-09-2017 21:12	0:01:33
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		15-09-2017 0:27	15-09-2017 0:29	0:02:00
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		17-09-2017 16:07	17-09-2017 16:07	0:00:11
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		18-09-2017 16:52	18-09-2017 17:04	0:11:23
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		18-09-2017 17:04	18-09-2017 17:06	0:02:08
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		18-09-2017 17:07	18-09-2017 17:12	0:04:53
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		20-09-2017 4:43	20-09-2017 4:43	0:00:06
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		21-09-2017 12:16	21-09-2017 12:29	0:12:56
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		21-09-2017 14:08	21-09-2017 14:12	0:04:08
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		22-09-2017 23:37	22-09-2017 23:38	0:00:08
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		26-09-2017 9:24	26-09-2017 9:35	0:11:25
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		27-09-2017 15:29	27-09-2017 15:29	0:00:26
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		27-09-2017 15:30	27-09-2017 15:56	0:26:22
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		27-09-2017 16:46	27-09-2017 16:49	0:03:39
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		27-09-2017 19:28	27-09-2017 19:32	0:04:08
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		27-09-2017 19:49	27-09-2017 20:03	0:14:13
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		28-09-2017 11:43	28-09-2017 11:44	0:00:41
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		28-09-2017 20:22	28-09-2017 20:22	0:00:07
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		28-09-2017 22:18	28-09-2017 22:18	0:00:12
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		01-10-2017 16:55	01-10-2017 16:57	0:01:42
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		01-10-2017 16:58	02-10-2017 7:01	14:03:03
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		02-10-2017 7:34	02-10-2017 7:38	0:04:07
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		02-10-2017 7:38	02-10-2017 7:57	0:18:29
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		02-10-2017 14:08	02-10-2017 14:08	0:00:06
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		03-10-2017 9:08	03-10-2017 14:11	5:02:52
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		03-10-2017 22:53	04-10-2017 6:13	7:19:19
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		05-10-2017 2:43	05-10-2017 2:44	0:01:01
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		05-10-2017 22:54	05-10-2017 22:56	0:01:38
GL350-360	350-360GL	GL350-360	0 - N/A	0	0	9	Manual Event - Shutdown	0		06-11-2017 5:12	06-11-2017 5:32	0:19:47

GL360-360	360-360GL	GL360-360	0 - N/A	0	0	0	9	Manual Event - Shutdown	0			06-11-2017 6:49	06-11-2017 6:52		0:02:57
GL360-360	360-360GL	GL360-360	0 - N/A	0	0	0	9	Manual Event - Shutdown	0			06-11-2017 12:05	06-11-2017 12:10		0:05:00
GL360-360	360-360GL	GL360-360	0 - N/A	0	0	0	9	Manual Event - Shutdown	0			07-11-2017 7:20	07-11-2017 7:23		0:03:04
GL360-360	360-360GL	GL360-360	0 - N/A	0	0	0	9	Manual Event - Shutdown	0			07-11-2017 10:35	07-11-2017 10:35		0:00:09
GL360-360	360-360GL	GL360-360	0 - N/A	0	0	0	9	Manual Event - Shutdown	0			08-11-2017 2:34	08-11-2017 2:38		0:03:13
GL360-360	360-360GL	GL360-360	0 - N/A	0	0	0	9	Manual Event - Shutdown	0			09-11-2017 16:05	09-11-2017 16:05		0:00:16
GL360-360	360-360GL	GL360-360	0 - N/A	0	0	0	9	Manual Event - Shutdown	0			09-11-2017 23:07	09-11-2017 23:07		0:00:07
GL360-360	360-360GL	GL360-360	0 - N/A	0	0	0	9	Manual Event - Shutdown	0			10-11-2017 10:38	10-11-2017 10:45		0:06:58
GL360-360	360-360GL	GL360-360	0 - N/A	0	0	0	9	Manual Event - Shutdown	0			10-11-2017 14:59	10-11-2017 14:59		0:00:15
GL360-360	360-360GL	GL360-360	0 - N/A	0	0	0	9	Manual Event - Shutdown	0			11-11-2017 1:25	11-11-2017 1:26		0:00:09
GL360-360	360-360GL	GL360-360	0 - N/A	0	0	0	9	Manual Event - Shutdown	0			11-11-2017 1:49	11-11-2017 1:49		0:00:07
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			15-09-2017 8:30	15-09-2017 8:35		0:04:37
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			15-09-2017 10:08	15-09-2017 10:17		0:09:03
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			15-09-2017 10:37	15-09-2017 10:38		0:00:56
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			15-09-2017 10:39	15-09-2017 10:43		0:03:45
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			15-09-2017 11:25	15-09-2017 11:26		0:00:17
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			15-09-2017 11:29	15-09-2017 11:32		0:03:53
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			15-09-2017 13:34	15-09-2017 13:39		0:05:06
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			15-09-2017 18:20	15-09-2017 18:21		0:01:17
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			16-09-2017 5:48	16-09-2017 7:07		1:19:09
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			16-09-2017 10:48	16-09-2017 12:32		1:43:51
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			16-09-2017 12:34	16-09-2017 12:37		0:03:07
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			16-09-2017 12:37	16-09-2017 12:40		0:02:45
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			16-09-2017 12:42	16-09-2017 12:43		0:00:43
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			16-09-2017 16:39	16-09-2017 16:52		0:13:18
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			16-09-2017 16:55	16-09-2017 16:55		0:00:29
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			16-09-2017 16:56	16-09-2017 16:56		0:01:02
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			18-09-2017 0:43	18-09-2017 0:48		0:05:38
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			18-09-2017 6:27	18-09-2017 6:27		0:00:09
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			18-09-2017 15:49	18-09-2017 15:54		0:04:50
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			18-09-2017 15:54	18-09-2017 15:55		0:01:02
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			01-10-2017 13:43	01-10-2017 13:44		0:01:18
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			03-10-2017 17:23	03-10-2017 18:19		1:56:14
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			03-10-2017 18:58	03-10-2017 19:06		0:08:48
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			03-10-2017 22:17	03-10-2017 22:44		0:27:41
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			03-10-2017 22:46	03-10-2017 22:48		0:02:35
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			06-10-2017 6:53	06-10-2017 7:43		0:49:34
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			09-10-2017 16:00	09-10-2017 16:01		0:00:56
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			07-10-2017 7:16	07-10-2017 7:17		0:01:26
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			09-10-2017 11:42	09-10-2017 11:48		0:06:27
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			09-10-2017 2:39	09-10-2017 2:39		0:00:01
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			12-10-2017 2:48	12-10-2017 2:54		0:06:34
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			12-10-2017 9:33	12-10-2017 9:34		0:00:17
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			12-10-2017 9:34	12-10-2017 9:34		0:00:38
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			13-10-2017 5:07	13-10-2017 5:08		0:00:08
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			13-10-2017 5:10	13-10-2017 5:10		0:00:06
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			13-10-2017 5:41	13-10-2017 7:38		1:56:50
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			14-10-2017 11:34	14-10-2017 11:40		0:15:35
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			14-10-2017 11:42	14-10-2017 12:50		1:08:32
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			14-10-2017 14:29	14-10-2017 14:29		0:01:28
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			14-10-2017 18:55	14-10-2017 18:55		0:00:09
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			14-10-2017 18:58	14-10-2017 18:58		0:00:07
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			15-10-2017 11:45	15-10-2017 11:47		0:01:33
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			15-10-2017 11:49	15-10-2017 11:50		0:00:55
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			15-10-2017 13:02	15-10-2017 13:02		0:00:09
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			15-10-2017 14:43	15-10-2017 14:43		0:00:34
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			15-10-2017 14:50	15-10-2017 14:50		0:00:01
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			15-10-2017 15:03	15-10-2017 15:04		0:00:34
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			15-10-2017 15:26	15-10-2017 15:27		0:00:07
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			15-10-2017 15:27	15-10-2017 15:27		0:00:17
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			15-10-2017 16:43	15-10-2017 16:43		0:00:01
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			16-11-2017 8:19	16-11-2017 8:22		0:02:57
GL067	B067GL	OP667GL	0 - PAG Gantry	0	0	0	9	Manual Event - Shutdown	0			16-11-2017 8:35	16-11-2017 8:35		0:00:06

GL067	BG67GL	GP67GL	0 - PAG Gantry	0	0	9 Manual Event - Shutdown	0		16-11-2017 8:38	16-11-2017 8:38		0:00:10
GL067	BG67GL	GP67GL	0 - PAG Gantry	0	0	9 Manual Event - Shutdown	0		16-11-2017 8:39	16-11-2017 8:39		0:00:01
GL067	BG67GL	GP67GL	0 - PAG Gantry	0	0	9 Manual Event - Shutdown	0		16-11-2017 22:30	16-11-2017 22:30		0:00:15
GL067	BG67GL	GP67GL	0 - PAG Gantry	0	0	9 Manual Event - Shutdown	0		18-11-2017 23:48	18-11-2017 23:48		0:00:06
GL067	BG67GL	GP67GL	0 - PAG Gantry	0	0	9 Manual Event - Shutdown	0		19-11-2017 17:15	19-11-2017 17:18		0:03:19
GL067	BG67GL	GP67GL	0 - PAG Gantry	0	0	9 Manual Event - Shutdown	0		19-11-2017 17:26	19-11-2017 17:27		0:01:41
GL067	BG67GL	GP67GL	0 - PAG Gantry	0	0	9 Manual Event - Shutdown	0		19-11-2017 20:02	19-11-2017 20:07		0:04:23
GL067	BG67GL	GP67GL	0 - PAG Gantry	0	0	9 Manual Event - Shutdown	0		23-10-2017 0:11	23-10-2017 0:15		0:04:34
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		27-08-2017 7:41	27-08-2017 7:57		0:15:56
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		27-08-2017 14:17	27-08-2017 14:17		0:00:00
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		28-08-2017 11:53	28-08-2017 11:53		0:00:00
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		29-08-2017 16:46	29-08-2017 16:52		0:06:47
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		29-08-2017 16:53	29-08-2017 16:56		0:02:36
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		29-08-2017 18:05	29-08-2017 18:20		0:14:31
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		01-09-2017 6:36	01-09-2017 6:36		0:00:21
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		01-09-2017 13:36	01-09-2017 13:36		0:00:51
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		01-09-2017 13:37	01-09-2017 13:38		0:01:04
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		01-09-2017 17:40	01-09-2017 17:40		0:00:03
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		02-09-2017 4:19	02-09-2017 4:19		0:00:11
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		02-09-2017 4:20	02-09-2017 4:24		0:04:39
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		02-09-2017 12:17	02-09-2017 12:17		0:00:03
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		04-09-2017 5:40	04-09-2017 6:06		0:25:48
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		04-09-2017 14:56	04-09-2017 14:56		0:00:03
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		04-09-2017 15:30	04-09-2017 15:30		0:00:15
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		04-09-2017 17:00	04-09-2017 17:05		0:05:35
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		04-09-2017 17:45	04-09-2017 18:10		0:25:44
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		04-09-2017 18:52	04-09-2017 19:05		0:13:03
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		04-09-2017 23:05	04-09-2017 23:10		0:05:07
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		05-09-2017 2:33	05-09-2017 3:00		0:26:43
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		05-09-2017 3:26	05-09-2017 3:59		0:32:38
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		05-09-2017 4:29	05-09-2017 4:32		0:02:31
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		05-09-2017 4:44	05-09-2017 4:48		0:03:51
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		05-09-2017 18:15	05-09-2017 18:59		0:43:39
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		05-09-2017 20:23	05-09-2017 20:33		0:09:52
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		05-09-2017 21:48	05-09-2017 22:06		0:17:59
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		05-09-2017 23:46	06-09-2017 0:03		0:17:21
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		06-09-2017 0:04	06-09-2017 0:05		0:00:40
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		06-09-2017 7:01	06-09-2017 7:07		0:06:16
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		06-09-2017 7:08	06-09-2017 7:11		0:03:31
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		06-09-2017 8:42	06-09-2017 8:52		0:10:19
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		06-09-2017 10:49	06-09-2017 10:58		0:09:01
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		06-09-2017 12:02	06-09-2017 12:02		0:00:29
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		06-09-2017 13:02	06-09-2017 13:18		0:15:47
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		06-09-2017 13:18	06-09-2017 13:21		0:03:04
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		06-09-2017 13:26	06-09-2017 13:26		0:00:03
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		06-09-2017 15:18	06-09-2017 15:38		0:19:34
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		06-09-2017 20:02	06-09-2017 20:41		0:39:20
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		06-09-2017 21:34	06-09-2017 21:39		0:06:23
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		06-09-2017 21:31	06-09-2017 21:33		0:01:53
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		06-09-2017 23:59	07-09-2017 0:11		0:12:19
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		07-09-2017 2:33	07-09-2017 2:33		0:00:56
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		07-09-2017 6:46	07-09-2017 6:46		0:00:44
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		07-09-2017 7:02	07-09-2017 7:18		0:15:37
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		07-09-2017 7:18	07-09-2017 7:20		0:01:16
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		07-09-2017 10:12	07-09-2017 10:14		0:02:12
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		07-09-2017 10:17	07-09-2017 10:19		0:01:19
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		07-09-2017 10:41	07-09-2017 10:42		0:00:20
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		07-09-2017 10:46	07-09-2017 10:47		0:02:09
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		07-09-2017 10:55	07-09-2017 10:55		0:00:33
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		07-09-2017 10:59	07-09-2017 10:59		0:00:40
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		07-09-2017 11:02	07-09-2017 11:05		0:03:16
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		07-09-2017 12:17	07-09-2017 12:17		0:00:07
GL068	BG68GL	GP68GL	0 - PAG GANTRY	0	0	9 Manual Event - Shutdown	0		07-09-2017 13:07	07-09-2017 13:12		0:04:44

GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		07-09-2017 17:08	07-09-2017 17:31	0:23:21
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		07-09-2017 20:27	07-09-2017 20:34	0:06:21
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		08-09-2017 15:02	08-09-2017 15:34	0:32:53
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		10-09-2017 1:12	10-09-2017 1:19	0:07:50
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		10-09-2017 6:13	10-09-2017 6:13	0:00:04
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		10-09-2017 6:52	10-09-2017 6:54	0:02:00
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		12-09-2017 0:00	12-09-2017 0:15	0:15:11
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		13-09-2017 11:58	13-09-2017 12:01	0:03:07
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		13-09-2017 12:11	13-09-2017 12:12	0:00:19
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		13-09-2017 12:52	13-09-2017 12:54	0:01:22
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		13-09-2017 12:54	13-09-2017 12:55	0:00:47
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		13-09-2017 12:56	13-09-2017 12:57	0:01:38
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		13-09-2017 13:16	13-09-2017 13:16	0:00:25
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		13-09-2017 13:17	13-09-2017 13:17	0:00:03
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		13-09-2017 13:41	13-09-2017 13:42	0:00:56
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		13-09-2017 15:16	13-09-2017 15:17	0:01:14
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		13-09-2017 15:18	13-09-2017 15:18	0:00:25
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		14-09-2017 10:24	14-09-2017 10:24	0:00:22
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		14-09-2017 11:52	14-09-2017 11:52	0:00:06
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		14-09-2017 11:53	14-09-2017 11:53	0:00:06
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		14-09-2017 12:41	14-09-2017 12:41	0:00:07
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		14-09-2017 12:42	14-09-2017 12:43	0:00:27
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		14-09-2017 12:53	14-09-2017 12:56	0:02:46
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		14-09-2017 12:56	14-09-2017 13:00	0:04:17
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		14-09-2017 13:01	14-09-2017 13:04	0:02:40
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		14-09-2017 13:13	14-09-2017 13:13	0:00:07
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		15-09-2017 13:09	15-09-2017 13:12	0:03:27
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		16-09-2017 14:55	16-09-2017 14:55	0:00:18
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		16-09-2017 14:57	16-09-2017 14:59	0:02:15
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		16-09-2017 15:00	16-09-2017 15:01	0:01:07
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		16-09-2017 18:20	16-09-2017 18:28	0:07:51
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		16-09-2017 18:28	16-09-2017 18:30	0:01:51
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		18-09-2017 1:02	18-09-2017 1:11	0:09:15
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		18-09-2017 6:27	18-09-2017 6:27	0:00:09
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		19-09-2017 3:20	19-09-2017 3:33	0:12:43
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		21-09-2017 8:34	21-09-2017 8:45	0:11:29
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		21-09-2017 10:22	21-09-2017 10:26	0:04:05
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		21-09-2017 11:41	21-09-2017 12:10	0:29:03
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		21-09-2017 15:26	21-09-2017 16:20	0:54:30
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		21-09-2017 17:25	21-09-2017 17:27	0:01:53
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		21-09-2017 19:03	21-09-2017 19:11	0:07:44
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		21-09-2017 20:01	21-09-2017 20:06	0:04:50
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		21-09-2017 21:23	21-09-2017 21:29	0:06:04
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		21-09-2017 22:21	21-09-2017 22:54	0:32:19
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		22-09-2017 0:05	22-09-2017 0:10	0:04:35
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		22-09-2017 1:30	22-09-2017 1:35	0:05:44
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		22-09-2017 2:03	22-09-2017 2:03	0:00:17
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		22-09-2017 2:32	22-09-2017 2:39	0:06:22
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		22-09-2017 3:22	22-09-2017 3:46	0:24:11
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		22-09-2017 4:42	22-09-2017 5:03	0:21:37
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		22-09-2017 6:37	22-09-2017 6:46	0:09:19
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		22-09-2017 7:23	22-09-2017 7:29	0:06:28
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		22-09-2017 7:41	22-09-2017 7:50	0:09:05
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		22-09-2017 8:08	22-09-2017 8:08	0:00:43
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		22-09-2017 8:17	22-09-2017 8:30	0:13:16
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		22-09-2017 8:48	22-09-2017 8:50	0:02:32
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		22-09-2017 8:57	22-09-2017 9:02	0:05:20
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		22-09-2017 9:40	22-09-2017 9:52	0:12:34
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		22-09-2017 11:00	22-09-2017 11:02	0:01:58
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		22-09-2017 13:13	22-09-2017 13:18	0:05:32
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		22-09-2017 14:10	22-09-2017 14:12	0:01:54
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		22-09-2017 14:14	22-09-2017 14:29	0:15:38
GL068	B068GL	OP068GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		22-09-2017 14:32	22-09-2017 14:32	0:00:42

GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			27-09-2017 23:04		27-09-2017 23:08		0:04:16
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			27-09-2017 23:11		27-09-2017 23:16		0:04:21
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			27-09-2017 23:33		27-09-2017 23:36		0:03:02
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			28-09-2017 0:07		28-09-2017 1:31		1:34:25
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			28-09-2017 3:35		28-09-2017 3:41		0:06:38
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			28-09-2017 3:46		28-09-2017 3:55		0:08:54
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			28-09-2017 7:02		28-09-2017 7:08		0:06:39
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			28-09-2017 7:38		28-09-2017 7:57		0:18:31
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			28-09-2017 8:22		28-09-2017 8:25		0:03:14
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			28-09-2017 8:57		28-09-2017 9:58		1:00:50
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			28-09-2017 10:08		28-09-2017 10:26		0:18:27
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			28-09-2017 10:28		28-09-2017 10:34		0:05:37
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			28-09-2017 10:41		28-09-2017 10:54		0:12:27
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			28-09-2017 10:58		28-09-2017 10:59		0:01:14
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			28-09-2017 11:11		28-09-2017 11:26		0:14:35
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			28-09-2017 11:35		28-09-2017 12:07		0:32:22
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			28-09-2017 12:29		28-09-2017 12:53		0:24:32
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			28-09-2017 12:57		28-09-2017 13:01		0:04:14
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			28-09-2017 13:03		28-09-2017 13:04		0:01:18
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			28-09-2017 13:05		28-09-2017 13:11		0:05:57
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			28-09-2017 13:12		28-09-2017 13:13		0:00:42
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			28-09-2017 13:19		28-09-2017 13:26		0:06:48
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			28-09-2017 13:30		28-09-2017 13:33		0:03:33
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			28-09-2017 16:59		28-09-2017 16:59		0:00:17
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			28-09-2017 16:00		28-09-2017 16:03		0:03:04
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			28-09-2017 16:10		28-09-2017 16:10		0:00:09
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			04-10-2017 10:43		04-10-2017 10:43		0:00:07
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			04-10-2017 10:46		04-10-2017 11:20		0:34:23
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			04-10-2017 11:21		04-10-2017 11:33		0:12:14
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			04-10-2017 12:46		04-10-2017 12:46		0:00:39
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			06-10-2017 14:50		06-10-2017 14:51		0:00:26
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			06-10-2017 14:51		06-10-2017 14:53		0:01:47
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			07-10-2017 7:16		07-10-2017 7:19		0:03:21
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			08-10-2017 14:31		08-10-2017 14:32		0:00:48
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			09-10-2017 14:33		09-10-2017 14:34		0:00:51
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			09-10-2017 15:09		09-10-2017 15:18		0:08:55
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			09-10-2017 19:19		09-10-2017 19:45		0:26:33
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			09-10-2017 17:47		09-10-2017 17:50		0:02:46
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			12-10-2017 9:30		12-10-2017 9:36		0:06:05
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			12-10-2017 9:37		12-10-2017 9:37		0:00:13
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			14-10-2017 14:28		14-10-2017 14:29		0:01:27
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			14-10-2017 14:56		14-10-2017 14:59		0:02:51
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			14-10-2017 16:02		14-10-2017 16:02		0:00:39
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			14-10-2017 18:51		14-10-2017 18:52		0:00:56
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			15-10-2017 16:21		15-10-2017 16:21		0:00:01
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			15-10-2017 16:33		15-10-2017 16:33		0:00:02
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			15-10-2017 16:42		15-10-2017 16:43		0:00:02
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			16-10-2017 6:17		16-10-2017 6:17		0:00:03
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			16-10-2017 8:16		16-10-2017 8:16		0:00:37
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			16-10-2017 8:25		16-10-2017 8:25		0:00:45
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			16-10-2017 8:27		16-10-2017 8:27		0:00:59
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			16-10-2017 8:28		16-10-2017 8:33		0:04:59
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			16-10-2017 8:39		16-10-2017 8:39		0:00:01
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			16-10-2017 9:25		16-10-2017 9:25		0:00:14
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			16-10-2017 9:26		16-10-2017 9:26		0:00:10
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			16-10-2017 9:29		16-10-2017 9:30		0:00:51
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			17-10-2017 10:32		17-10-2017 10:32		0:00:08
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			17-10-2017 10:46		17-10-2017 10:46		0:00:10
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			17-10-2017 14:25		17-10-2017 14:25		0:00:21
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			17-10-2017 14:30		17-10-2017 14:31		0:00:47
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			18-10-2017 6:10		18-10-2017 6:10		0:00:25
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			18-10-2017 10:24		18-10-2017 10:25		0:01:23
GL068	EO68GL	OP68GL	O - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			18-10-2017 10:44		18-10-2017 10:47		0:02:59

GL068	B068GL	OP068GL	0 - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			19-10-2017 16:25	19-10-2017 16:25		0:00:02
GL068	B068GL	OP068GL	0 - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			19-10-2017 17:18	19-10-2017 17:25		0:07:10
GL068	B068GL	OP068GL	0 - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			19-10-2017 17:28	19-10-2017 17:32		0:04:39
GL068	B068GL	OP068GL	0 - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			19-10-2017 20:06	19-10-2017 20:06		0:00:25
GL068	B068GL	OP068GL	0 - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			19-10-2017 20:07	19-10-2017 20:08		0:01:38
GL068	B068GL	OP068GL	0 - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			20-10-2017 22:12	20-10-2017 22:12		0:00:16
GL068	B068GL	OP068GL	0 - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			22-10-2017 0:11	22-10-2017 0:17		0:06:19
GL068	B068GL	OP068GL	0 - PAG GANTRY	0		0	9 Manual Event - Shutdown	0			22-10-2017 15:59	22-10-2017 15:59		0:00:06
GL070	B070GL	OP070GL	0 - Back	0		0	9 Manual Event - Shutdown	0			16-09-2017 10:13	16-09-2017 10:13		0:00:36
GL070	B070GL	OP070GL	44 - AJ126 S/C	0		0	9 Manual Event - Shutdown	0			20-09-2017 16:29	20-09-2017 16:29		0:00:06
GL070	B070GL	OP070GL	44 - AJ126 S/C	0		0	9 Manual Event - Shutdown	0			20-09-2017 16:29	20-09-2017 16:29		0:00:02
GL070	B070GL	OP070GL	44 - AJ126 S/C	0		0	9 Manual Event - Shutdown	0			20-09-2017 20:24	20-09-2017 20:24		0:00:10
GL070	B070GL	OP070GL	44 - AJ126 S/C	0		0	9 Manual Event - Shutdown	0			01-10-2017 9:39	01-10-2017 9:42		0:03:53
GL070	B070GL	OP070GL	44 - AJ126 S/C	0		0	9 Manual Event - Shutdown	0			01-10-2017 16:48	02-10-2017 14:09		21:21:04
GL070	B070GL	OP070GL	44 - AJ126 S/C	0		0	9 Manual Event - Shutdown	0			02-10-2017 14:12	02-10-2017 14:12		0:00:07
GL070	B070GL	OP070GL	44 - AJ126 S/C	0		0	9 Manual Event - Shutdown	0			02-10-2017 14:14	02-10-2017 14:14		0:00:06
GL070	B070GL	OP070GL	44 - AJ126 S/C	0		0	9 Manual Event - Shutdown	0			02-10-2017 14:25	02-10-2017 14:25		0:00:07
GL070	B070GL	OP070GL	44 - AJ126 S/C	0		0	9 Manual Event - Shutdown	0			02-11-2017 14:26	02-11-2017 14:26		0:00:23
GL070	B070GL	OP070GL	44 - AJ126 S/C	0		0	9 Manual Event - Shutdown	0			02-11-2017 14:27	02-11-2017 14:28		0:00:37
GL070	B070GL	OP070GL	44 - AJ126 S/C	0		0	9 Manual Event - Shutdown	0			02-11-2017 14:40	02-11-2017 14:43		0:02:42
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			27-08-2017 6:21	27-08-2017 6:22		0:00:23
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			28-09-2017 3:14	28-09-2017 3:16		0:01:33
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			28-09-2017 6:09	28-09-2017 6:11		0:02:02
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			29-09-2017 6:18	29-09-2017 6:19		0:00:20
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			29-09-2017 6:45	29-09-2017 6:50		0:00:51
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			29-09-2017 16:01	29-09-2017 16:02		0:00:30
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			31-08-2017 7:05	31-08-2017 7:06		0:01:26
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			01-09-2017 12:07	01-09-2017 12:07		0:00:08
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			02-09-2017 22:23	02-09-2017 22:23		0:00:58
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			06-09-2017 16:55	06-09-2017 16:55		8:53:10
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			07-09-2017 14:10	07-09-2017 14:10		0:00:53
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			07-09-2017 23:41	07-09-2017 23:41		0:00:19
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			08-09-2017 15:52	08-09-2017 15:52		0:00:09
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			09-09-2017 5:29	09-09-2017 5:29		0:00:12
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			09-09-2017 18:07	09-09-2017 18:07		0:00:12
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			10-09-2017 2:28	10-09-2017 2:28		0:00:20
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			10-09-2017 11:49	10-09-2017 11:49		0:00:11
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			10-09-2017 12:26	10-09-2017 12:27		0:01:04
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			11-09-2017 1:01	11-09-2017 1:01		0:00:10
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			11-09-2017 10:57	11-09-2017 10:57		0:00:18
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			12-09-2017 23:51	12-09-2017 23:51		0:00:12
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			14-09-2017 16:53	14-09-2017 16:53		0:00:10
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			16-09-2017 18:56	16-09-2017 18:58		0:03:06
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			18-09-2017 3:19	18-09-2017 3:19		0:00:28
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			19-09-2017 23:21	19-09-2017 23:36		0:05:14
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			20-09-2017 0:35	20-09-2017 0:38		0:02:45
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			20-09-2017 0:38	20-09-2017 0:41		0:03:00
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			20-09-2017 0:50	20-09-2017 0:54		0:03:31
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			20-09-2017 1:35	20-09-2017 1:36		0:00:57
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			20-09-2017 2:28	20-09-2017 2:28		0:00:21
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			20-09-2017 3:01	20-09-2017 3:01		0:01:21
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			20-09-2017 3:40	20-09-2017 3:41		0:00:53
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			20-09-2017 4:34	20-09-2017 4:34		0:00:43
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			20-09-2017 4:35	20-09-2017 4:35		0:00:17
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			20-09-2017 4:46	20-09-2017 4:46		0:00:13
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			20-09-2017 10:57	20-09-2017 11:01		0:04:51
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			20-09-2017 11:47	20-09-2017 11:48		0:00:39
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			20-09-2017 12:15	20-09-2017 12:15		0:00:19
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			20-09-2017 12:46	20-09-2017 12:48		0:02:02
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			20-09-2017 13:15	20-09-2017 13:15		0:02:40
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			20-09-2017 18:19	20-09-2017 18:33		0:13:54
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			21-09-2017 9:12	21-09-2017 9:17		0:04:44
GL100	B100GL	OP100GL	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			21-09-2017 12:41	21-09-2017 12:42		0:01:03

GL100	B1000L	QF1000L	0 - Pag Block	0		0	9 Manual Event - Shutdown	0			22-09-2017 16:38	22-09-2017 16:39			0:00:20
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			22-09-2017 18:17	22-09-2017 22:09			3:51:31
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			22-09-2017 23:19	22-09-2017 23:20			0:00:16
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			22-09-2017 23:33	22-09-2017 23:33			0:00:18
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			23-09-2017 13:12	23-09-2017 13:12			0:00:20
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			23-09-2017 14:17	23-09-2017 14:33			0:16:33
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			23-09-2017 15:15	23-09-2017 15:16			0:00:16
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			23-09-2017 16:07	23-09-2017 16:08			0:00:58
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			23-09-2017 16:27	23-09-2017 16:29			0:01:18
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			23-09-2017 16:32	23-09-2017 16:47			0:15:16
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			23-09-2017 19:30	23-09-2017 19:31			0:00:13
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			23-09-2017 20:59	23-09-2017 21:00			0:00:55
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			24-09-2017 18:10	24-09-2017 18:10			0:00:31
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			24-09-2017 19:33	24-09-2017 19:34			0:00:11
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			24-09-2017 22:48	24-09-2017 22:48			0:01:38
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			26-09-2017 2:00	26-09-2017 2:00			0:00:11
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			26-09-2017 4:17	26-09-2017 4:18			0:00:08
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			27-09-2017 2:16	27-09-2017 2:16			0:00:11
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			27-09-2017 4:41	27-09-2017 4:43			0:01:38
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			27-09-2017 5:17	27-09-2017 5:18			0:00:20
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			27-09-2017 5:27	27-09-2017 5:28			0:00:16
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			27-09-2017 5:36	27-09-2017 5:39			0:02:45
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			27-09-2017 6:07	27-09-2017 6:08			0:01:07
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			27-09-2017 10:53	27-09-2017 10:54			0:00:46
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			28-09-2017 14:15	28-09-2017 14:19			0:04:38
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			28-09-2017 14:45	28-09-2017 14:45			0:00:29
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			01-10-2017 9:05	01-10-2017 9:11			0:06:41
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			01-10-2017 16:45	01-10-2017 16:45			0:00:01
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			04-10-2017 12:41	04-10-2017 12:42			0:00:39
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			05-10-2017 7:29	05-10-2017 7:47			0:17:35
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			05-10-2017 9:32	05-10-2017 9:36			0:03:49
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			05-10-2017 9:44	05-10-2017 9:45			0:00:45
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			05-10-2017 9:54	05-10-2017 9:54			0:00:39
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			05-10-2017 10:05	05-10-2017 10:06			0:00:38
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			05-10-2017 10:40	05-10-2017 10:40			0:00:33
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			05-10-2017 16:32	05-10-2017 16:32			0:00:16
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			06-11-2017 14:17	06-11-2017 14:18			0:00:15
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			07-11-2017 1:40	07-11-2017 1:40			0:00:19
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			09-11-2017 22:20	10-11-2017 4:16			5:55:24
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			17-11-2017 1:58	17-11-2017 2:01			0:03:09
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			17-11-2017 19:34	17-11-2017 19:34			0:00:11
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			18-11-2017 23:23	18-11-2017 23:23			0:00:23
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			19-11-2017 15:27	19-11-2017 15:28			0:00:17
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			19-11-2017 16:06	19-11-2017 16:07			0:00:56
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			19-11-2017 18:36	19-11-2017 18:37			0:00:16
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			20-11-2017 14:19	20-11-2017 14:26			0:07:06
GL100	B1000L	QF1000L	44 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			20-11-2017 22:12	20-11-2017 22:12			0:00:12
GL105	B1050L	QF1050L	1 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			27-08-2017 12:12	27-08-2017 12:35			0:23:06
GL105	B1050L	QF1050L	1 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			27-08-2017 22:14	27-08-2017 22:15			0:00:40
GL105	B1050L	QF1050L	1 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			30-08-2017 13:01	30-08-2017 13:19			0:18:29
GL105	B1050L	QF1050L	1 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			07-09-2017 11:05	07-09-2017 11:09			0:04:09
GL105	B1050L	QF1050L	1 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			10-09-2017 4:24	10-09-2017 4:44			0:20:27
GL105	B1050L	QF1050L	1 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			14-09-2017 5:42	14-09-2017 6:36			0:54:11
GL105	B1050L	QF1050L	1 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			16-09-2017 1:46	16-09-2017 1:51			0:05:52
GL105	B1050L	QF1050L	1 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			16-09-2017 13:01	16-09-2017 13:20			0:18:01
GL105	B1050L	QF1050L	1 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			21-09-2017 10:58	21-09-2017 11:51			0:52:51
GL105	B1050L	QF1050L	1 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			23-09-2017 11:11	23-09-2017 11:29			0:18:34
GL105	B1050L	QF1050L	1 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			23-09-2017 16:46	23-09-2017 17:23			0:37:14
GL105	B1050L	QF1050L	1 - PAG Gantry	0		0	9 Manual Event - Shutdown	0			16-10-2017 8:13	16-10-2017 8:29			0:16:15
GL110	B1100L	QF1100L	44 - AJ126 S/C	0		0	9 Manual Event - Shutdown	0			27-08-2017 22:23	27-08-2017 22:27			0:04:42
GL110	B1100L	QF1100L	44 - AJ126 S/C	0		0	9 Manual Event - Shutdown	0			01-09-2017 2:57	01-09-2017 2:57			0:00:10
GL110	B1100L	QF1100L	44 - AJ126 S/C	0		0	9 Manual Event - Shutdown	0			03-09-2017 15:30	03-09-2017 15:32			0:02:16
GL110	B1100L	QF1100L	0 - Pag Block	0		0	9 Manual Event - Shutdown	0			03-09-2017 15:32	03-09-2017 15:33			0:00:11

GL110	B1100L	QP1100L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			04-09-2017 19:04	04-09-2017 19:56		0:01:41
GL110	B1100L	QP1100L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			05-09-2017 9:34	05-09-2017 9:34		0:00:01
GL110	B1100L	QP1100L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			06-09-2017 17:05	06-09-2017 17:05		0:00:01
GL110	B1100L	QP1100L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			06-09-2017 21:34	06-09-2017 21:34		0:00:11
GL110	B1100L	QP1100L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			07-09-2017 5:27	07-09-2017 5:27		0:00:09
GL110	B1100L	QP1100L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			07-09-2017 9:42	07-09-2017 9:42		0:00:08
GL110	B1100L	QP1100L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			07-09-2017 11:29	07-09-2017 11:29		0:01:01
GL110	B1100L	QP1100L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			08-09-2017 10:33	08-09-2017 10:33		0:00:07
GL110	B1100L	QP1100L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			10-09-2017 4:36	10-09-2017 4:36		0:00:14
GL110	B1100L	QP1100L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			11-09-2017 16:36	11-09-2017 16:36		0:00:15
GL110	B1100L	QP1100L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			15-09-2017 9:46	15-09-2017 9:46		0:00:58
GL110	B1100L	QP1100L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			16-09-2017 4:33	16-09-2017 4:33		0:00:07
GL110	B1100L	QP1100L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			21-09-2017 4:42	21-09-2017 4:45		0:02:29
GL110	B1100L	QP1100L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			21-09-2017 10:55	21-09-2017 10:55		0:00:04
GL110	B1100L	QP1100L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			21-09-2017 14:08	21-09-2017 14:51		0:43:44
GL110	B1100L	QP1100L	0 - Plug Block		0		0	9 Manual Event - Shutdown	0			21-09-2017 14:51	21-09-2017 14:52		0:00:28
GL110	B1100L	QP1100L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			24-09-2017 19:12	24-09-2017 19:12		0:00:19
GL110	B1100L	QP1100L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			27-09-2017 16:33	27-09-2017 16:33		0:00:11
GL110	B1100L	QP1100L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			27-09-2017 16:34	27-09-2017 16:34		0:00:07
GL110	B1100L	QP1100L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			27-09-2017 16:38	27-09-2017 16:38		0:00:38
GL110	B1100L	QP1100L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			01-10-2017 16:49	02-10-2017 9:54		17:04:59
GL110	B1100L	QP1100L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			05-10-2017 7:15	05-10-2017 7:15		0:00:20
GL110	B1100L	QP1100L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			10-10-2017 4:16	10-10-2017 6:17		2:01:19
GL110	B1100L	QP1100L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			13-10-2017 2:01	13-10-2017 2:01		0:00:01
GL110	B1100L	QP1100L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			13-10-2017 16:00	13-10-2017 16:00		0:00:19
GL110	B1100L	QP1100L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			13-10-2017 23:59	14-10-2017 0:00		0:00:13
GL110	B1100L	QP1100L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			17-11-2017 1:04	17-11-2017 1:04		0:00:08
GL110	B1100L	QP1100L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			19-11-2017 14:23	19-11-2017 15:17		0:54:35
GL110	B1100L	QP1100L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			20-11-2017 2:09	20-11-2017 2:09		0:00:08
GL110	B1100L	QP1100L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			20-11-2017 9:47	20-11-2017 9:47		0:00:07
GL110	B1100L	QP1100L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			23-11-2017 16:03	23-11-2017 16:03		0:00:17
GL120	B1200L	QP1200L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			17-09-2017 9:47	17-09-2017 9:47		0:00:09
GL120	B1200L	QP1200L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			17-09-2017 16:48	17-09-2017 16:48		0:00:09
GL120	B1200L	QP1200L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			18-09-2017 10:28	18-09-2017 11:14		0:45:47
GL120	B1200L	QP1200L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			19-09-2017 11:44	19-09-2017 11:44		0:00:11
GL120	B1200L	QP1200L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			20-09-2017 22:13	20-09-2017 22:14		0:00:01
GL120	B1200L	QP1200L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			21-09-2017 0:17	21-09-2017 0:17		0:00:01
GL120	B1200L	QP1200L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			21-09-2017 12:08	21-09-2017 12:09		0:00:01
GL120	B1200L	QP1200L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			22-09-2017 10:51	22-09-2017 10:52		0:00:12
GL120	B1200L	QP1200L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			22-09-2017 15:07	22-09-2017 15:07		0:00:03
GL120	B1200L	QP1200L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			23-09-2017 12:56	23-09-2017 12:56		0:00:13
GL120	B1200L	QP1200L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			24-09-2017 11:47	24-09-2017 11:48		0:00:59
GL120	B1200L	QP1200L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			27-09-2017 5:15	27-09-2017 5:15		0:00:09
GL120	B1200L	QP1200L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			29-09-2017 6:55	29-09-2017 6:55		0:00:51
GL120	B1200L	QP1200L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			29-09-2017 22:13	29-09-2017 22:13		0:00:05
GL120	B1200L	QP1200L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			01-10-2017 16:49	02-10-2017 12:12		19:23:06
GL120	B1200L	QP1200L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			02-10-2017 14:18	02-10-2017 14:19		1:56:54
GL120	B1200L	QP1200L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			02-10-2017 17:05	03-10-2017 6:23		13:16:46
GL120	B1200L	QP1200L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			03-10-2017 13:14	03-10-2017 13:14		0:00:09
GL120	B1200L	QP1200L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			04-10-2017 9:38	04-10-2017 9:38		0:00:08
GL120	B1200L	QP1200L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			04-10-2017 9:42	04-10-2017 9:42		0:00:07
GL120	B1200L	QP1200L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			05-10-2017 0:19	05-10-2017 0:19		0:00:06
GL120	B1200L	QP1200L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			06-10-2017 11:56	06-10-2017 11:56		0:00:07
GL120	B1200L	QP1200L	41 - AJ133 N/A		0		0	9 Manual Event - Shutdown	0			08-10-2017 18:48	08-10-2017 18:48		0:00:09
GL120	B1200L	QP1200L	41 - AJ133 N/A		0		0	9 Manual Event - Shutdown	0			08-10-2017 18:49	08-10-2017 18:49		0:00:08
GL120	B1200L	QP1200L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			09-10-2017 6:15	09-10-2017 6:17		0:01:53
GL120	B1200L	QP1200L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			09-10-2017 10:46	09-10-2017 10:47		0:01:29
GL120	B1200L	QP1200L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			09-10-2017 14:34	09-10-2017 14:36		0:01:09
GL120	B1200L	QP1200L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			11-10-2017 21:33	11-10-2017 21:34		0:00:06
GL120	B1200L	QP1200L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			19-10-2017 14:31	19-10-2017 14:32		0:00:49
GL120	B1200L	QP1200L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			19-10-2017 19:01	19-10-2017 19:01		0:00:06
GL120	B1200L	QP1200L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			19-10-2017 9:05	19-10-2017 12:14		3:09:36
GL120	B1200L	QP1200L	44 - AJ126 S/C		0		0	9 Manual Event - Shutdown	0			19-10-2017 12:19	19-10-2017 13:28		1:08:23

GL120	B120GL	OP120GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		19-11-2017 22:37	19-11-2017 22:37	0:00:07
GL120	B120GL	OP120GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		20-11-2017 0:31	20-11-2017 0:31	0:00:08
GL120	B120GL	OP120GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		21-11-2017 9:15	21-11-2017 9:50	0:34:43
GL120	B120GL	OP120GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		25-11-2017 2:49	25-11-2017 2:50	0:01:02
GL120	B120GL	OP120GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		25-11-2017 2:51	25-11-2017 2:53	0:02:46
GL120	B120GL	OP120GL	0 - PAG GANTRY	0	0	9	Manual Event - Shutdown	0		25-11-2017 2:54	25-11-2017 2:58	0:03:34
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		16-09-2017 15:01	16-09-2017 15:01	0:00:07
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		17-09-2017 9:37	17-09-2017 9:37	0:00:06
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		19-09-2017 11:45	19-09-2017 11:46	0:00:21
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		22-09-2017 2:45	22-09-2017 2:45	0:00:20
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		22-09-2017 10:23	22-09-2017 10:24	0:01:11
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		23-09-2017 14:12	23-09-2017 14:13	0:01:34
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		23-09-2017 16:46	23-09-2017 16:46	0:00:18
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		23-09-2017 20:19	23-09-2017 20:19	0:00:18
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		23-09-2017 23:44	23-09-2017 23:46	0:02:29
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		24-09-2017 1:16	24-09-2017 1:24	0:07:10
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		24-09-2017 2:17	24-09-2017 2:30	0:12:50
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		24-09-2017 3:44	24-09-2017 3:50	0:05:31
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		25-09-2017 4:56	25-09-2017 4:56	0:00:08
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		28-09-2017 7:12	28-09-2017 7:16	0:04:09
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		28-09-2017 7:27	28-09-2017 7:27	0:00:09
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		28-09-2017 10:03	28-09-2017 10:03	0:00:07
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		28-09-2017 10:47	28-09-2017 10:49	0:01:12
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		28-09-2017 11:09	28-09-2017 11:10	0:01:22
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		01-10-2017 16:49	02-10-2017 6:45	13:55:56
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		02-10-2017 10:28	02-10-2017 10:29	0:00:22
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		02-10-2017 10:31	02-10-2017 10:31	0:00:07
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		02-10-2017 10:32	02-10-2017 10:32	0:00:07
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		02-10-2017 10:51	02-10-2017 10:51	0:00:06
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		02-10-2017 12:33	02-10-2017 12:33	0:00:07
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		02-10-2017 12:51	02-10-2017 12:51	0:00:06
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		02-10-2017 12:52	02-10-2017 12:52	0:00:08
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		02-10-2017 12:54	02-10-2017 12:54	0:00:07
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		02-10-2017 12:55	02-10-2017 12:55	0:00:06
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		02-10-2017 12:57	02-10-2017 12:57	0:00:06
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		02-10-2017 12:58	02-10-2017 12:58	0:00:07
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		02-10-2017 18:16	02-10-2017 18:37	0:20:32
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		02-10-2017 18:47	02-10-2017 18:47	0:00:08
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		02-10-2017 20:43	02-10-2017 20:43	0:00:08
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		03-10-2017 8:07	03-10-2017 8:07	0:00:07
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		06-10-2017 9:35	06-10-2017 9:35	0:00:07
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		06-10-2017 13:54	06-10-2017 13:54	0:00:08
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		07-10-2017 2:03	07-10-2017 2:03	0:00:07
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		08-10-2017 18:47	08-10-2017 18:47	0:00:08
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		09-10-2017 1:09	09-10-2017 1:09	0:00:10
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		11-10-2017 21:22	11-10-2017 21:22	0:00:07
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		13-10-2017 21:15	13-10-2017 21:15	0:00:07
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		13-10-2017 21:32	13-10-2017 21:32	0:00:07
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		14-11-2017 19:49	14-11-2017 19:50	0:00:11
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		14-11-2017 19:54	14-11-2017 19:54	0:00:16
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		14-11-2017 19:58	14-11-2017 20:02	0:04:09
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		15-11-2017 4:18	15-11-2017 4:18	0:00:07
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		15-11-2017 14:11	15-11-2017 14:11	0:00:14
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		15-11-2017 14:16	15-11-2017 14:16	0:00:09
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		15-11-2017 14:16	15-11-2017 14:18	0:01:32
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		16-11-2017 19:26	16-11-2017 19:26	0:00:10
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		19-11-2017 16:38	19-11-2017 16:38	0:00:08
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		20-11-2017 0:37	20-11-2017 0:37	0:00:10
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		20-11-2017 0:38	20-11-2017 0:38	0:00:13
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		21-11-2017 20:26	21-11-2017 20:26	0:00:13
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		21-11-2017 21:05	21-11-2017 21:06	0:00:13
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		21-11-2017 21:08	21-11-2017 21:11	0:03:43
GL130	B130GL	OP130GL	44 - AJ126 S/C	0	0	9	Manual Event - Shutdown	0		21-11-2017 21:12	21-11-2017 21:13	0:00:20

GL130	B130GL		GP130GL	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			23-11-2017 9:54	23-11-2017 9:54		0:00:11
GL130	B130GL		GP130GL	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			23-11-2017 22:14	23-11-2017 22:20		0:06:10
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			27-08-2017 7:16	27-08-2017 7:19		0:03:20
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			27-08-2017 8:26	27-08-2017 8:32		0:06:24
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			27-08-2017 13:19	27-08-2017 13:20		0:00:59
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			27-08-2017 13:21	27-08-2017 13:23		0:01:54
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			27-08-2017 13:52	27-08-2017 14:28		0:37:03
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			27-08-2017 16:20	27-08-2017 16:47		0:27:03
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			27-08-2017 17:38	27-08-2017 17:51		0:13:52
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			27-08-2017 18:15	27-08-2017 18:21		0:06:36
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			27-08-2017 19:05	27-08-2017 19:09		0:03:55
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			27-08-2017 19:23	27-08-2017 19:30		0:06:33
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			27-08-2017 19:52	27-08-2017 20:02		0:10:39
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			27-08-2017 20:23	27-08-2017 20:23		0:02:32
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			27-08-2017 20:41	27-08-2017 20:42		0:00:55
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			27-08-2017 20:47	27-08-2017 20:48		0:00:07
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			27-08-2017 23:46	27-08-2017 23:54		0:07:14
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			28-08-2017 0:37	29-08-2017 0:46		0:09:10
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			29-08-2017 0:47	29-08-2017 0:48		0:00:08
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			29-08-2017 19:44	29-08-2017 20:34		0:49:38
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			29-08-2017 21:27	29-08-2017 21:32		0:05:39
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			29-08-2017 21:47	29-08-2017 22:09		0:22:29
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			29-08-2017 22:54	29-08-2017 22:57		0:02:33
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			29-08-2017 22:57	29-08-2017 22:59		0:02:44
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			29-08-2017 1:34	29-08-2017 1:34		0:00:36
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			29-08-2017 2:23	29-08-2017 2:25		0:01:59
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			29-08-2017 2:49	29-08-2017 2:53		0:04:15
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			29-08-2017 5:03	29-08-2017 5:07		0:04:07
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			29-08-2017 5:21	29-08-2017 5:24		0:02:38
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			29-08-2017 11:19	29-08-2017 11:30		0:11:40
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			29-08-2017 13:01	29-08-2017 13:06		0:05:00
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			29-08-2017 14:51	29-08-2017 15:03		0:12:20
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			29-08-2017 15:28	29-08-2017 15:47		0:18:19
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			29-08-2017 16:35	29-08-2017 16:59		0:23:11
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			29-08-2017 17:23	29-08-2017 17:33		0:10:07
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			29-08-2017 18:44	29-08-2017 18:44		0:00:09
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			29-08-2017 19:23	29-08-2017 19:46		0:22:45
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			29-08-2017 19:54	29-08-2017 19:59		0:04:44
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			29-08-2017 23:59	29-08-2017 23:59		0:00:01
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			30-08-2017 0:40	30-08-2017 0:50		0:10:09
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			30-08-2017 3:19	30-08-2017 3:24		0:05:44
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			30-08-2017 5:30	30-08-2017 5:35		0:05:13
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			30-08-2017 5:43	30-08-2017 6:14		0:31:03
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			30-08-2017 6:37	30-08-2017 6:40		0:02:51
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			30-08-2017 6:58	30-08-2017 7:34		0:36:11
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			30-08-2017 8:37	30-08-2017 8:45		0:08:35
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			30-08-2017 13:35	30-08-2017 14:04		0:28:58
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			30-08-2017 14:33	30-08-2017 14:37		0:04:11
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			30-08-2017 15:01	30-08-2017 15:16		0:14:47
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			30-08-2017 15:32	30-08-2017 15:32		0:00:17
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			30-08-2017 15:32	30-08-2017 15:35		0:02:39
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			30-08-2017 15:43	30-08-2017 15:47		0:04:07
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			30-08-2017 15:52	30-08-2017 16:08		0:16:00
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			01-09-2017 17:00	01-09-2017 17:00		0:00:20
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			06-09-2017 0:32	06-09-2017 0:37		0:04:42
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			06-09-2017 0:37	06-09-2017 0:38		0:00:34
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			06-09-2017 0:39	06-09-2017 0:40		0:01:37
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			09-09-2017 3:02	09-09-2017 4:22		1:20:04
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			09-09-2017 4:59	09-09-2017 5:01		0:01:46
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			21-09-2017 12:46	21-09-2017 12:46		0:00:39
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			22-09-2017 0:54	22-09-2017 0:54		0:00:07
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			22-09-2017 1:00	22-09-2017 1:01		0:00:41
GL140		140.1GL	GL140.1	44 - N/135 S/C	0		0	9 Manual Event - Shutdown	0			22-09-2017 1:05	22-09-2017 1:05		0:00:26

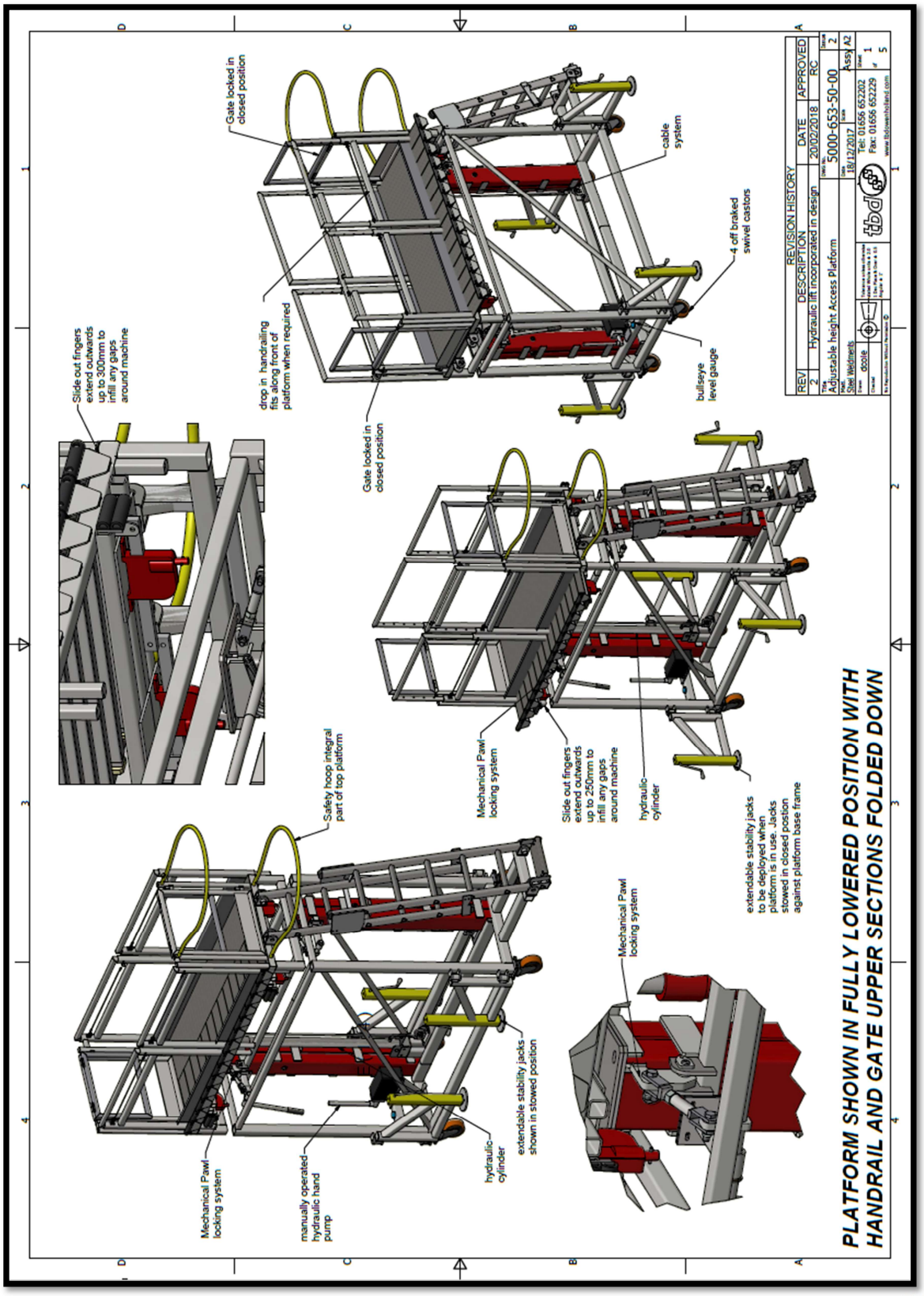
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			23-09-2017 6:42	23-09-2017 6:54	0.1206
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			24-09-2017 4:49	24-09-2017 4:58	0.0846
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			02-10-2017 9:06	02-10-2017 9:06	0.0013
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			04-10-2017 2:47	04-10-2017 2:56	0.0936
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			07-10-2017 19:54	07-10-2017 19:55	0.0009
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			07-10-2017 19:58	07-10-2017 19:58	0.0004
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			07-10-2017 20:01	07-10-2017 20:01	0.0007
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			07-10-2017 21:07	07-10-2017 21:07	0.0023
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			07-10-2017 21:09	07-10-2017 21:10	0.0127
GL140	140.1GL	GL140.1	41 - V8 Right Hand	0	0	9	Manual Event - Shutdown	0			07-10-2017 21:11	07-10-2017 21:12	0.0103
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			08-10-2017 18:38	08-10-2017 18:43	0.0512
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			08-10-2017 18:44	08-10-2017 18:50	0.0631
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			08-10-2017 18:51	08-10-2017 18:51	0.0030
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			12-10-2017 8:34	12-10-2017 9:04	0.5230
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			12-11-2017 14:19	12-11-2017 14:25	0.0631
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			13-11-2017 22:27	13-11-2017 22:27	0.0011
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			16-11-2017 12:58	16-11-2017 12:58	0.0007
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			16-11-2017 23:01	16-11-2017 23:03	0.0142
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			17-11-2017 18:57	17-11-2017 19:03	0.0612
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			17-11-2017 23:12	17-11-2017 23:29	0.1701
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			19-11-2017 13:06	19-11-2017 13:12	0.0606
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			19-11-2017 13:37	19-11-2017 14:05	0.2735
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			19-11-2017 15:15	19-11-2017 15:15	0.0007
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			19-11-2017 15:31	19-11-2017 15:31	0.0007
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			19-11-2017 15:32	19-11-2017 15:32	0.0006
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			19-11-2017 15:37	19-11-2017 15:40	0.0241
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			21-11-2017 11:44	21-11-2017 11:58	0.1407
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			22-11-2017 22:19	22-11-2017 22:27	0.0823
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			22-11-2017 23:23	22-11-2017 23:27	0.0439
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			23-11-2017 18:07	23-11-2017 18:35	0.3145
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			24-11-2017 3:23	24-11-2017 3:30	0.0723
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			24-11-2017 23:03	24-11-2017 23:03	0.0007
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			25-11-2017 4:34	25-11-2017 4:36	0.0213
GL140	140.1GL	GL140.1	44 - AU26 S/C	0	0	9	Manual Event - Shutdown	0			25-11-2017 4:36	25-11-2017 4:50	0.1333
										Total		22-11-1905 0:00	4445.1612

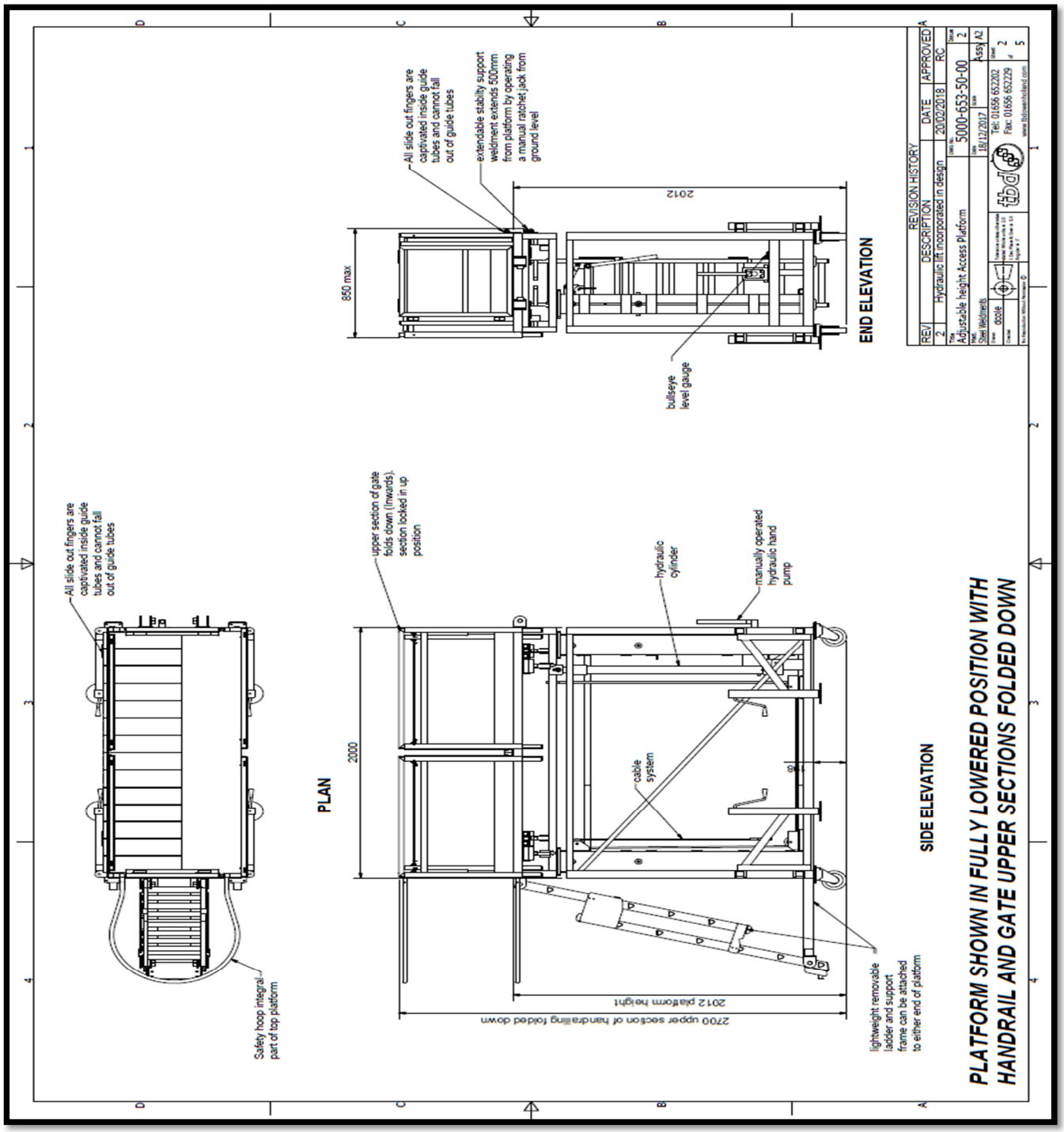
12.12 Appendix 12

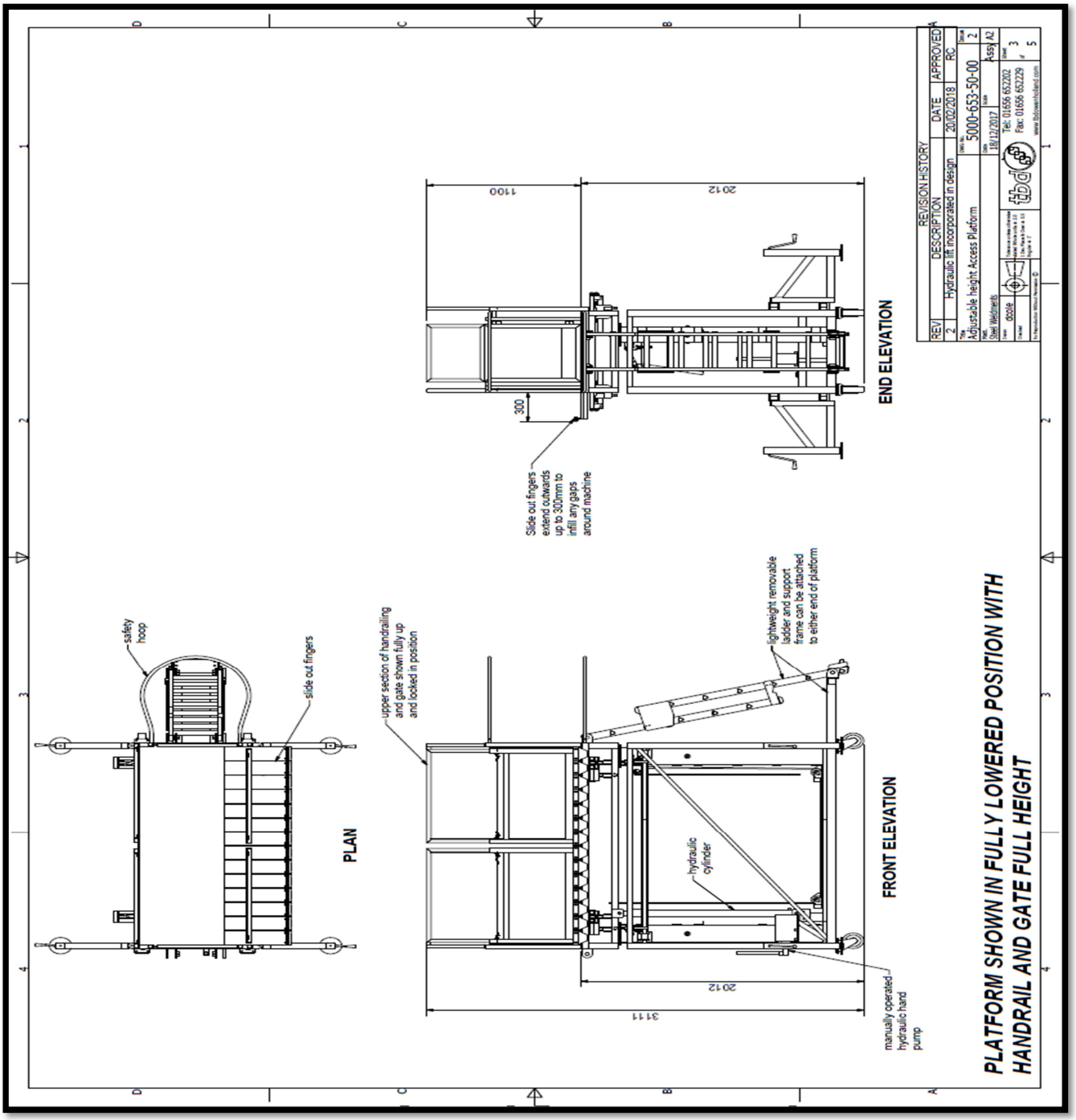
Equipment	Start Time	Duration (HH:MM:SS)	Handover Book Explanation	Downtime type
GL320	04-08-17 0:00	1:20:00	Operation 320.3 needs a new tool magazine. Cell shutdown for scaffolding	Scaffolding
GL140	27-08-17 13:50	0:37:03	Two air leaks found and repaired.	Air leak
GL140	27-08-17 16:20	0:27:02		
GL140	28-08-17 19:44	0:49:38	Watchdog fault, Proxy cleaned and gantry reset	Cleaning
GL140	28-08-17 21:47	1:22:29	Gripper locator damaged. Gantry lowered into SPS for replacement.	Part Replaced
GL140	29-08-17 16:35	0:23:11		
GL140	29-08-17 19:23	0:22:40	Air leak found and repaired.	Air leak
GL140	30-08-17 5:43	0:31:43	Down with clamping fault. Suspect part clamp valve passing. Part ordered	Investigation
GL140	30-08-17 6:58	0:36:11	Clamping fault awaiting part	Awaiting Part
GL140	30-08-17 13:35	0:28:58	Down with clamping fault. Part replaced	Part Replaced
GL015	31-08-17 0:44	0:59:55	Lube fault. Lube manifold cleaned, seized parts replaced.	Part Replaced
GL067	02-09-17 17:23	12:56:14		
GL068	04-09-17 5:40	0:25:44		
GL068	04-09-17 17:45	0:26:43	Conveyor stop below incoming gantry conveyor not raising in the allotted time frame.	Part Replaced
GL068	05-09-17 2:33	0:32:38	Gripper showing part present after depositing block. Swarf stuck to proxy.	Cleaning
GL068	05-09-17 3:26	0:43:39	Lube fault. Lube manifold cleaned, seized parts replaced.	Part Replaced
GL068	05-09-17 18:15	0:39:20		
GL070	06-09-17 20:02	0:23:21	Watchdog fault, Proxy cleaned and gantry reset	Cleaning
GL110	07-09-17 17:08	1:32:53	Marposs receiver on 110.4 faulting out with no signal. Receiver full of coolant and needs replacing. Gantry down for scaffolding erection	Scaffolding
GL068	08-09-17 15:02	0:29:03		
GL015	14-09-17 5:39	1:41:29		
GL067	16-09-17 5:48	1:19:09	Belt snapped on Z2 axis	Part Replaced
GL067	16-09-17 10:48	1:43:51	Damaged Lumburg unit. Replaced with new	Part Replaced
GL340	21-09-17 9:00	0:28:49	Pliz unit not giving OK signal. Loose cable, replaced and tightened.	Reset
GL110	21-09-17 11:41	0:28:46	Scaffolding removal on 110.4	Scaffolding
GL070	21-09-17 15:26	0:54:30	Lube fault. Lube manifold cleaned, seized parts replaced.	Part Replaced
GL068	21-09-17 22:21	0:32:19	Circuit breaker tripped.	Reset
GL068	22-09-17 3:22	0:24:11		
GL340	22-09-17 12:41	3:16:54	Repeatedly faulting throughout shift. Temp comp problems, some offsets changed in the program.	Re-teach
GL070	26-09-17 0:21	0:42:28	70 Gantry slowed down due to noise on x-axis. Maintenance must be scheduled in to repair.	Investigation
GL340	27-09-17 21:46	0:32:48	Investigated reason repeated temp comp faults. Found incorrect proxy fitted, correct one ordered, awaiting part. running in the meantim	Investigation
GL340	01-10-17 16:46	14:14:57	Pipe work above the gantry dropped into the path of the gantry masts. Crash situation. Mechanical estates called to repair pipe work.	Crash
GL350-360	02-10-17 17:33	4:51:02		
GL067	03-10-17 22:17	0:27:47		
GL080	04-10-17 0:00	0:56:20	Four leaking/damaged pneumatic pipes replaced on 80 gantry.	Air leak
GL067	05-10-17 6:53	0:49:34	Relay in electrical cabinet jammed in. Replaced	Part Replaced
GL100	05-10-17 8:10	8:53:10		
GL320	07-10-17 0:00	1:20:00	New toolchanger and gearbox needed for 320.2. Gantry shutdown for scaffolding erection.	Scaffolding
GL350-360	07-10-17 19:09	0:23:40		
GL140	09-10-17 3:10	1:20:04		
GL105	10-10-17 4:24	0:20:27		
GL350-360	10-10-17 9:17	1:57:00	Y-axis leadscrew on 350.1 needs replacing. Gantry down to put up scaffolding.	Scaffolding
GL350-360	10-10-17 18:26	3:52:42		
GL320	11-10-17 0:00	3:00:00	Crash on 320 gantry.	Crash
GL320	11-10-17 0:00	1:20:00	Operation 320.1 needs a replacement y-axis leadscrew. Gantry shut down to allow for scaffolding erection.	Scaffolding
GL105	14-10-17 5:42	0:54:11	Lube fault. Lube manifold cleaned, seized parts replaced.	Part Replaced
GL320	18-10-17 0:00	1:20:00	Operation 320.3 requiring a new x-axis leadscrew. Gantry shutdown as scaffolding put up	Scaffolding
GL120	18-10-17 10:28	0:45:47		
GL105	21-10-17 10:56	0:52:51	Interbus cable damaged. Ordered from stores and replaced.	Part Replaced
GL110	21-10-17 14:08	1:20:44	Scaffolding needed to replace Marposs receiver on operation 110.1.	Scaffolding
GL070	22-10-17 4:42	0:21:37	70 Gantry . Air leak repaired.	Air leak
GL100	22-10-17 13:17	3:51:31	Magazine change required on 100.5. Gantry down for scaffolding to be put-up.	Scaffolding
GL068	22-10-17 18:28	0:25:21		
GL070	22-10-17 19:50	0:58:50		
GL068	22-10-17 21:34	0:36:39	Indramat z1 axis drive faulting out with excessive deviation. Checked offsets, adjusted and reset.	Reset

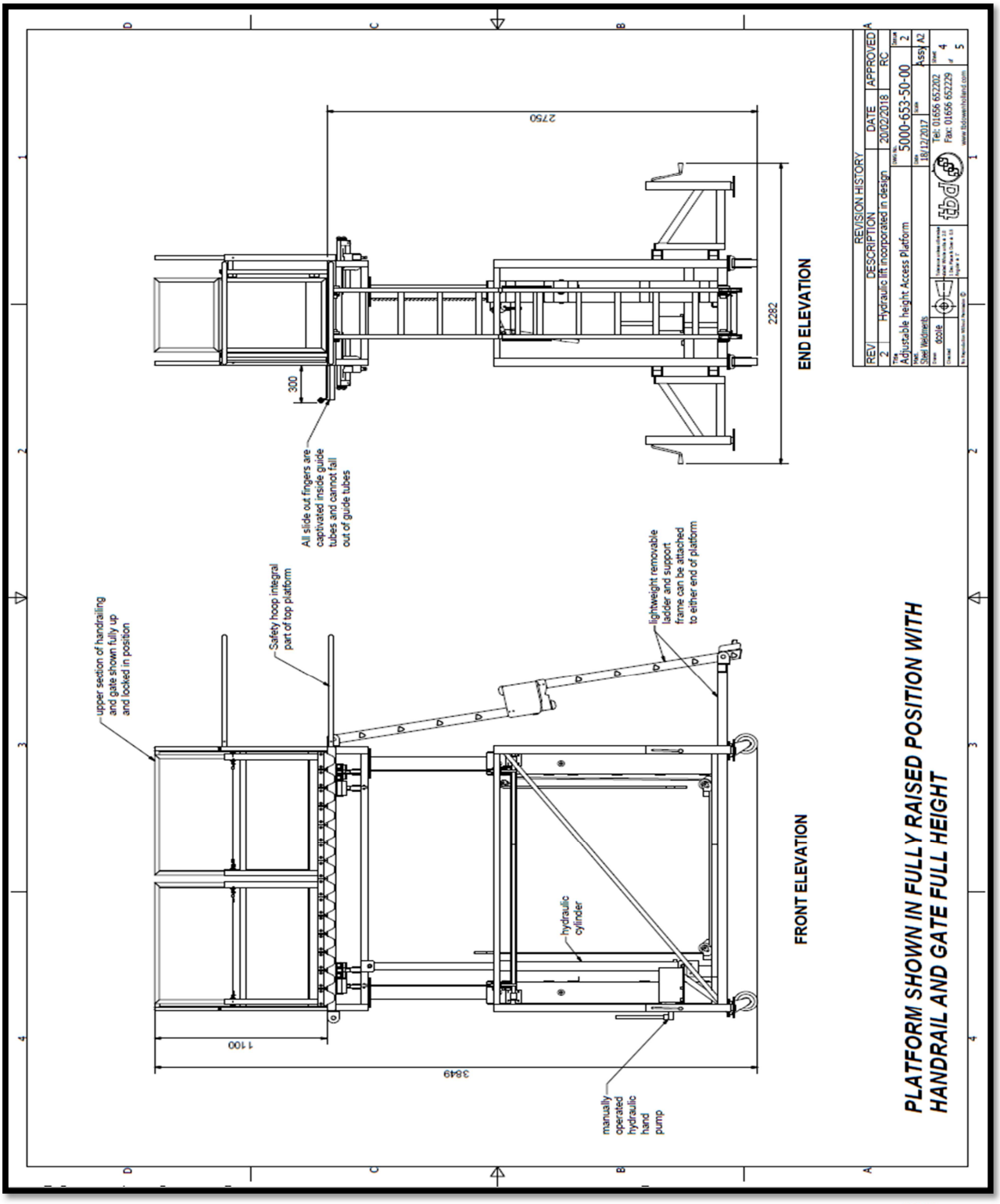
GL060	23-10-17 0:00	1:20:00	Operation 80.5 requiring a new x-axis leadscrew. Gantry shutdown as scaffolding put up	Scaffolding
GL068	23-10-17 12:07	0:27:05		
GL068	23-10-17 13:00	0:24:59	Watchdog fault, Proxy cleaned and gantry reset	Cleaning
GL068	23-10-17 16:09	0:32:15		
GL105	23-10-17 16:45	0:37:14		
GL068	24-10-17 3:16	0:22:42		
GL068	24-10-17 4:59	1:24:57	Faulting out with safety guard not closed. Safety relay replaced.	Part Replaced
GL110	24-10-17 8:28	0:32:57	Scaffolding removal on 110.1.	Scaffolding
GL070	24-10-17 21:06	0:35:00	Gripper not showing open. Dirty proxy.	Cleaning
GL320	25-10-17 0:00	1:20:00	Operation 320.1 needs scaffolding removal. Gantry down for this removal.	Scaffolding
GL068	25-10-17 13:39	1:30:10		
GL068	25-10-17 15:16	0:25:43		
GL068	25-10-17 16:08	0:22:23		
GL068	25-10-17 18:05	0:23:54	Sercos loop fault, tightened plugs and reset.	Reset
GL070	27-10-17 4:27	4:26:18	X-axis motor replaced on 70 gantry.	Part Replaced
GL068	27-10-17 5:17	0:29:54		
GL068	27-10-17 7:40	0:27:22		
GL070	28-10-17 8:57	1:00:50	Damaged proxy ordered and replaced.	Part Replaced
GL070	28-10-17 11:07	1:24:29	Y-axis motor needs replacing. Gantry shutdown to allow scaffolding to be erected.	Scaffolding
GL350-360	28-10-17 11:35	0:32:22	Scaffolding removal on 350.1.	Scaffolding
GL070	28-10-17 12:29	0:24:32	Temperature fault , program latched up, gantry restarted and homed. OK	Reset
GL320	01-11-17 0:00	0:52:00	Scheduled Maintenance. Z2 referenced (+1mm)	Scheduled Maintenance
GL070	01-11-17 16:48	21:21:04	Down for scheduled maintenance	Scheduled Maintenance
GL110	01-11-17 16:49	2:04:59	Down for scheduled maintenance	Scheduled Maintenance
GL120	01-11-17 16:49	19:23:06	Scheduled repair to Z2 mast. Has previously been involved in a crash, running on single mast for several months.	Scheduled Maintenance
GL130	01-11-17 16:49	13:55:56	Down for scheduled maintenance	Scheduled Maintenance
GL350-360	01-11-17 16:55	0:26:22	Down for scheduled maintenance	Scheduled Maintenance
GL120	02-11-17 12:18	1:56:54	Down for scheduled maintenance	Scheduled Maintenance
GL350-360	02-11-17 14:08	12:03:03	Down for scheduled maintenance	Scheduled Maintenance
GL120	02-11-17 17:05	13:16:46	Down for scheduled maintenance	Scheduled Maintenance
GL130	02-11-17 18:16	0:20:32	Down for scheduled maintenance	Scheduled Maintenance
GL350-360	03-11-17 9:08	3:02:52	Cable needs replacing atop 350.2. Cell down for scaffolding.	Scaffolding
GL340	03-11-17 22:45	3:59:00		
GL100	03-11-17 22:53	9:19:19		
GL340	04-11-17 4:43	0:55:42	Gantry index faults. X-axis re-taught, +2mm at pick up input conveyor.	Re-teach
GL340	04-11-17 5:19	0:53:11	Gantry unable to pick up part. X-axis re-taught, +2mm at pick up input conveyor.	Re-teach
GL070	04-11-17 10:46	6:34:21	Major crash on gantry Z2. large amounts of replacement parts required. Running on Z1 only atm	Crash
GL070	08-11-17 19:19	0:56:20	Four leaking/damaged pneumatic pipes replaced on 70 gantry.	Air leak
GL340	09-11-17 8:23	1:59:58		
GL100	09-11-17 12:20	3:55:24	Magazine change required on 100.5. Gantry down for scaffolding to be put-up.	Scaffolding
GL110	10-11-17 9:16	2:01:19	New X-axis leadscrew needed on operation 110.3. Gantry down for scaffolding.	Scaffolding
GL340	12-11-17 6:53	3:41:26		
GL350-360	12-11-17 8:34	0:32:30	Scaffolding removal on 350.2.	Scaffolding
GL320	13-11-17 0:00	0:26:43	Conveyor stop replaced at gantry pick up, gantry shut down for safety.	Part Replaced
GL340	13-11-17 3:55	1:11:16		
GL067	13-11-17 5:41	1:56:50	Snapped belt on Z axis. Replaced and referenced.	Part Replaced
GL340	14-11-17 1:55	2:13:15	X-axis drive faulting repeatedly. Removed and replaced	Part Replaced
GL067	14-11-17 11:40	1:09:30		
GL340	15-11-17 18:07	4:03:15		
GL340	16-11-17 14:05	6:18:37		
GL070	19-11-17 9:05	3:09:26	Further repairs to 70 gantry Z2 after crash on 04/11/17	Crash
GL120	19-11-17 12:19	1:08:23	Problem with harmonic drive. Z1 mast shutdown until parts can be sourced and repairs scheduled. Z2 mast running.	Investigation
GL140	19-11-17 13:37	0:27:25	Air leak found and repaired.	Air leak
GL110	19-11-17 14:23	0:54:35	Scaffolding removal on 110.3 and 110.1.	Scaffolding
GL120	21-11-17 9:15	0:34:43	Air leak found and repaired.	Air leak
GL140	23-11-17 18:07	0:31:57	Lube fault. Lube manifold cleaned, seized parts replaced.	Part Replaced
GL105	27-11-17 12:12	1:43:06	Scaffolding removal from 100.5 &100.6	Scaffolding

12.13 Appendix 13




All slide out fingers are captivated inside guide tubes and cannot fall out of guide tubes
extendable stability support weldment extends 500mm from platform by operating a manual ratchet jack from ground level
2012
850 max
bullseye level gauge
END ELEVATION
REVISION HISTORY
REV
DESCRIPTION
DATE
APPROVED
2
Hydraulic lift incorporated in design
20/02/2018
RC
Adjustable height Access Platform
5000-653-50-00
Assy
A2
Sheet Weldments
18/12/2017
Tel: 01656 652202
Fax: 01656 652229
www.tidoweholland.com
All slide out fingers are captivated inside guide tubes and cannot fall out of guide tubes
upper section of gate folds down (inwards). section locked in up position
hydraulic cylinder
manually operated hydraulic hand pump
PLAN
2000
cable system
2700 upper section of handrailing folded down
2012 platform height
SIDE ELEVATION
Safety hoop integral part of top platform
lightweight removable ladder and support frame can be attached to either end of platform
PLATFORM SHOWN IN FULLY LOWERED POSITION WITH HANDRAIL AND GATE UPPER SECTIONS FOLDED DOWN


REVISION HISTORY
REV
DESCRIPTION
DATE
APPROVED
2
Hydraulic lift incorporated in design
20/02/2018
RC
Adjustable height Access Platform
5000-653-50-00
Assy
A2
18/12/2017
Steel Weldments
dcole
Tel: 01656 652202
Fax: 01656 652229
www.tbdowenholland.com
END ELEVATION
1100
2012
300
Slide out fingers extend outwards up to 300mm to infill any gaps around machine
safety hoop
slide out fingers
PLAN
upper section of handrailing and gate shown fully up and locked in position
lightweight removable ladder and support frame can be attached to either end of platform
hydraulic cylinder
FRONT ELEVATION
2012
3111
manually operated hydraulic hand pump
PLATFORM SHOWN IN FULLY LOWERED POSITION WITH HANDRAIL AND GATE FULL HEIGHT


2750
2282
300
END ELEVATION
All slide out fingers are captivated inside guide tubes and cannot fall out of guide tubes
upper section of handrailing and gate shown fully up and locked in position
Safety hoop integral part of top platform
lightweight removable ladder and support frame can be attached to either end of platform
hydraulic cylinder
1100
3849
manually operated hydraulic hand pump
FRONT ELEVATION
PLATFORM SHOWN IN FULLY RAISED POSITION WITH HANDRAIL AND GATE FULL HEIGHT
REVISION HISTORY
REV DESCRIPTION DATE APPROVED
2 Hydraulic lift incorporated in design 20/02/2018 RC
Adjustable height Access Platform
Steel Weldments
5000-653-50-00
18/12/2017
Assy A2
dosle
Tel: 01656 652202
Fax: 01656 652229