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MSc in Sustainable construction



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**Written Assignment for Module: Management of the
Integrated Working Environment (ACBA7006)**

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Risk Assessment Report:

1.1 Introduction:

Every construction project has certain uncertainties, each uncertainty has different degrees of impact on the project. Some impacts can be mitigated whereas, some can be avoided [1]. Risk Management plays an important role in identifying, classifying and managing the risks of the project. Risk management further decreases the downtime of the building and increases the lifetime of the structure. In this report, risks of a UWTSD Swansea portfolio (IQ, Fforwm, Dynevor, Alex, Swansea Business campus and Dylan Thomas) is discussed and comprehensive way to improve energy savings are laid out.

1.2 Risk Analysis:

The Regulatory Reform (Fire Safety) order, 2005. To ensure the fire safety precautions for the SA1 Buildings [2].

Fire Risk Assessment: The objective of fire risk assessment is to reduce the chances of fires, or if any accident occurs it should be controlled quickly and everyone in the building should be able to escape in total safety. The document should be regularly updated and revised and amended if any alterations are made to the buildings. The building should carry out appropriate fire-fighting equipment. These buildings have Hot food serving areas, these premises have higher chance of risk factor so roof sprinklers and hose reels are required. The Fire equipment and Alarms should undergo annual maintenance by industry standard experts. All students and staff should have a compulsory session on fire safety alarms, symbols and fire exits. Alex building and other campuses are integrated with the automatic fire detection system. These systems should be checked weekly and undergo biannual maintenance by the experts [3].

According to the UK fire safety legislation act, if rooms area is larger than 60 sq. Meters, emergency lightings should be installed: Escape route lighting Open Area Lighting High Risk Task Area Lighting. These lightings should be undergone 3 hour test period. Annual fire drills should be conducted to ensure students and staff safety [4]. Alex building has a combination of concrete, glass and wooden structure. Exterior portion of the building is made up of glass. Alex buildings is used for art exhibitions, halls are leased and shared with fellow business and students. Fire safety should be included in the contract and legal duties should be clearly stated. Premises and fire exit layout should be handed to the responsible event handler.

After inspection details and changes advised by the enforcing authority should be documented and reassess the potential risk and undergo the changes. After the inform the authorities regarding the alterations. Alex building is multi story building, emergency staircase and emergency doors are regularly maintained for ease of evacuating in case of fires.

Table 1: General Risk Assessment of UWTSD SAI campus

Ref No	Activities that are considered	Activities that are considered	Risk Factor: Risk Factor depend on individual degree and activity ,Check appendix			Control Measures	Residual Risk:	Action By
			Severity	Severity	Risk		Risk after control measures	
1	Manual Handling physical damages	Office Workers	Moderate	Possible	Medium	Avoid pushing and hauling big goods. Lift just the product-appropriate pan. Manual handling assessments should recommend lifting assistance or trolleys. Spray taps prevent sink pan lifting. Varying duties prevents repetitiveness. Maintain posture and minimize twisting and reaching. Adequate kitchen design reduces facility movement. Buy ingredients in manageable packages. Waist-high shelves should hold hefty, frequently used objects. Mobile steps and staff training are needed. Avoid stooping and straining by raising sinks. Manual handling-trained staff.	Low	nominated Rep.
2	Gas Appliances	Staff, students and Visitors	Very Severe	Very Unlikely	Medium	Check gas appliance controls daily and have a Gas Safe-registered engineer examine, maintain, and test them annually. In an emergency, staff should know how to turn off the main isolation tap. Ovens need flame failure devices.	Low	Certified Gas Engineer
3	Machinery accidents	Office Workers	Moderate	Possible	Medium	Most buildings are accessible, and the estate has accessible parking. Lifted buildings have Refuge Points in case the fire alarm sounds and the person cannot escape via stairs or the lift breaks down and they are stuck above the ground floor. If elevator fails, security workers are instructed to utilise evacuation chairs.	Low	nominated Rep
4	Fire	Staff, students and Visitors	Very Severe	Possible	High	Staff should get fire risk assessments. Staff should understand evacuation. Keep flammables away from bare flames.	Medium	consultant
5	Pressure Systems	Office Workers	Very Severe	Very Unlikely	Medium	Qualified engineers should do periodic inspections.	Low	Suitable consultant
6	Working Temperature	Office Workers	Severe	Possible	High	Fans and extractors control air temperature and remove steam. Staff should take breaks in cool places. Staff should be urged to drink water offered.	Low	Head of department
7	Chemicals and Art Paints	Students	Moderate	Possible	Medium	Only CoSHH-assessed cleaning products are allowed. Ordering supplies over less dangerous chemicals. Provide rubber gloves, aprons, and eye protection. If cleaning a laboratory, make sure personnel know how it's used and communicate with users if necessary. Preserve chemicals. Staff should report skin issues so chemicals may be designated, and actions taken. Mops and brushes to avoid chemical contact. Store reusable gloves after washing and drying. Use goods per the SDS. Cleaning product use and storage are taught to staff. Transfer chemicals to indicated containers only.	Low	nominated Rep.
8	Working at Height	Office Workers	Severe	Unlikely	High	Staff must be taught to utilize ladders and other equipment. To avoid stretching and twisting, place ladders properly. Only low-level, short-duration work should be done on ladders.	Very Low	Head of department
9	Cleaning Machines	Office Workers	Moderate	Very Unlikely	Low	Task-appropriate computers should be offered. Machine maintenance should follow manufacturer instructions. Staff learn to clean machinery. Regular maintenance reduces machine cleaning. Do not use a broken machine and report it immediately.	Low	Head of department
10	Electrical Appliances	Office Workers	Very Severe	Unlikely	High	Staff learn basic electrical safety and pre-use visual checks. Defective equipment should be isolated and reported. PAT test equipment over 2 years old yearly.	Low	Dean / Head and / or nominated Rep.
11	Eyestrain	Computer Users	Slightly	Likely	Medium	Operators should operate in shifts and take 15-minute breaks from the screen every hour.	Very Low	Dean / Head and / or nominated Rep.
12	Handling Sharp Tools	Operator	Moderate	possible	Medium	Sharp knives prevent "sawing." Secure handles. Use appropriate tools like solid chopping boards. Safely store sharp instruments in purpose-built holders with coverings. Never hide knives in sinks. Carrying down. Cut outward. Ensure proper guarding. Only skilled users should utilize sharp tools. Deboning meat requires protective gloves. Knives are not can openers.	Low	Dean / Head and / or nominated Rep.

13	Ultraviolet Radiation	Staff, students and Visitors	Slightly	Very Unlikely	Very Low	Photocopiers and laser printers, Follow the manufacturer's servicing schedule. Heavy-use equipment should be kept away from workstations and well-ventilated.	Very Low	Dean / Head and / or nominated Rep.
14	Work Related Upper Limb Disorders	User	Slightly	possible	Low	Check the user's VDU evaluation and desk posture. Assess the workstation using the Health and Safety (Display Screen Equipment) Regulations, 1992. Make sure users understand the DSE Regulations and can alter their workstations to comply.	Low	Dean / Head and / or nominated Rep.

Table 2: Fire Risk Assessment of UWTSD SA1 campus

Ref No	Activities that are considered	Activities that are considered	Risk Factor: Risk Factor depend on individual degree and activity, Check appendix			Control Measures	Residual Risk:	Action By
			Severity	Likelihood	Risk		Risk after control measures	
1	Overloaded electrical sockets and faulty wiring	Users	Moderate	Possible	Medium	Regular inspection and testing of electrical systems. Prompt repair of any electrical faults. Provision of adequate electrical outlets to prevent overloading	Low	nominated Rep
2	Arson attacks	Staff	Slightly	Possible	Low	Check gas appliance controls daily and have a Gas Safe-registered engineer examine, maintain, and test them annually. In an emergency, staff should know how to turn off the main isolation tap. Ovens need flame failure devices.	Low	nominated Rep
3	Blocked escape routes and exits	Staff and Students	Very Severe	Possible	extremely high	Regular inspection and maintenance of escape routes and exits. Clear signage indicating fire escape routes. Provision of emergency lighting	Low	nominated Rep
4	Malfunctioning heating equipment	Staff	Moderate	Unlikely	Medium	Regular inspection and maintenance of heating equipment. Installation of smoke detectors and fire alarms. Provision of fire extinguishers and fire blankets	Low	nominated Rep
5	Improper storage of combustible waste	Staff	Moderate	Very Unlikely	Low	Provision of clearly marked waste containers for combustible materials. Regular waste disposal and removal. Training for staff and students on proper waste disposal procedures.	Low	nominated Rep

Table 3: Noise Assessment of UWTSD SA1 campus

Ref No	Activities that are considered	Activities that are considered	Risk Factor: Risk Factor depend on individual degree and activity, Check appendix			Control Measures	Residual Risk:	Action By
			Severity	Likelihood	Risk		Risk after control measures	
1	noise from construction	Staff and Students	Moderate	Possible	Medium	Regular inspection and testing of electrical systems. Prompt repair of any electrical faults. Provision of adequate electrical outlets to prevent overloading	Low	nominated Rep.
2	Exposure to high levels of noise from Machines	students	Slightly	Possible	Low	Consistent monitoring of noise levels as per the Control of Noise at Work Regulations (2005) guidelines. Provisioning of personal protective equipment, such as earplugs and earmuffs, in compliance with the Personal Protective Equipment at Work Regulations (1992) as a graduate student. Restricting entry to loud zones during hazardous tasks.	Low	nominated Rep
3	Exposure to noise from music events and concerts	Staff and Students	Very Severe	Possible	extremely high	Monitoring noise levels during music events and concerts in accordance with the Licensing Act (2003) is an important aspect of my graduate studies. The implementation of sound barriers and acoustic curtains is a common practice in limiting the propagation of noise. Restricting the length of events and musical performances.	Low	nominated Rep
4	Exposure to noise from office equipment, such as	Staff	Moderate	Unlikely	Medium	Provision of quiet areas for concentration and work as a graduate student. Limiting noise emissions by maintaining office equipment. Encouraging fellow graduate students and faculty	Low	nominated Rep.

	printers and photocopiers					members to utilize electronic communication methods and minimize the use of paper.		
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Table 4:Financial and Market Risk Assessment of UWTSD SA1 campus

Risk Category	Risk Description	Impact on University	Recommended Action
Financial Risks	Revenue and Funding Risks	A decrease in student enrolment or retention rates may lead to a reduction in revenue, as well as fluctuations in government funding, grants, and donations.	it is important to consider diversifying revenue sources by proposing new courses and programs, broadening research activities, and investigating novel funding opportunities.
	Operational Risks	Cybersecurity threats, legal risks, and risks to your reputation can all cause you to lose money and hurt your image.	Invest in cybersecurity measures, establish effective risk management systems, and improve governance and compliance processes.
	Investment Risks	Investment market values are prone to fluctuation, which may lead to monetary losses.	By making investments in a variety of assets, including real estate, stocks, and bonds, you may create a diversified investment portfolio.
	Interest Rate Risks	The borrowing costs and investment returns of the university may be impacted by changes in interest rates.	Diversify your investment portfolio and put interest rate hedging ideas into practice.
Market Risks			
	Student Enrolment and Retention Risks	Any reduction in enrolment or retention rates may result in a decrease in revenue.	Increase marketing initiatives to promote the university's brand, provide scholarships and financial help, and recruit and keep students.
	Competition Risks	Decreased enrolment rates and income can result from heightened competition.	Create strong marketing plans to set the university apart from its rivals.
	Regulatory Risks	Financial fines and reputational harm may result from failing to abide with regulatory standards.	To ensure compliance, create a regulatory compliance program and periodically review policies and processes.
	Political Risks	Government financing and the number of overseas students enrolled might be impacted by political unrest or changes in policy.	Keep an eye on political changes and adjust to new government regulations.
	Environmental Risks	Natural catastrophes and climate change can interrupt operations and harm university property.	To lessen the effects of environmental hazards, develop a thorough environmental risk management plan.

2.1: Task 2, Improving Energy Efficiency for Alex Building

Alex building (Swansea collage of art) is located near city center of Swansea city opened in 2016 [5]. Alex building has state of the art facilities consist of lecture rooms, Library, Large Halls, IT desks, HAVC systems.

The standard BS EN ISO 50001:2018 specifies the requirements for an energy management system (EnMS) [6]. The standard provides a framework for organisations to manage their energy performance, increase energy efficiency, and decrease greenhouse gas emissions. The PDCA-based BS EN ISO 50001:2018 standard contains requirements for establishing an energy policy, identifying and analysing energy use and consumption, setting energy performance objectives, implementing action plans to improve energy performance, monitoring and measuring energy performance, and reviewing and continuously improving the EnMS [6].

Organizations face risks and possibilities when implementing an Energy Management System (EnMS). Some of the Risks are Staff training, consultants, and energy infrastructure upgrades may be needed to deploy an EnMS. If the projected advantages don't materialise or the organisation can't control these charges, they're a risk. Resistance to change: Employees and stakeholders may reject changes needed to implement an EnMS. Regulatory compliance: Energy efficiency regulations might lead to penalties, fines, or legal action. Some of the opportunities are Cost savings: An EnMS can discover energy efficiency improvements that reduce energy usage and related costs. Improved reputation: Implementing an EnMS shows an organization's dedication to sustainability and energy efficiency, which attracts consumers, workers, and investors. Innovation: EnMS implementation encourages staff to discover and execute energy saving initiatives. Competitive advantage: An EnMS may help an organisation differentiate itself from competitors and fulfil consumer and stakeholder sustainability and energy efficiency needs [7].



Figure 1:energy Management cycle

It is predicted that UK and mainland Europe to face comparable energy security concerns next winter as in 2022-23 due to geopolitical uncertainties generated by Russia's invasion of Ukraine. This Plan outlines how we will use the last years' experience to evaluate all supply security possibilities. Through UK linkages to European gas networks and worldwide LNG markets, Britain is indirectly affected by Russian gas, which made up just 4% of UK gas supplies in 2021. projected figures is shown in fig 2.



Q4 UK Liquefied natural gas imports
Source: ICIS LNG EDGE (Independent Commodity Intelligence Services)

Figure 2:UK natural gas imports line graph

To lower energy consumption, Management should increase minimum energy performance standards and energy labelling for energy-using items. Lighting consultations will run through 2023, followed by other technologies during the next year.

The energy management standard BS EN ISO 50001 is applicable to a variety of organisations, including universities. Following the standard can help ensure that the university building procures energy in a sustainable and efficient manner when it comes to energy procurement. Here are some possible actions:

The first stage in energy procurement is to establish a baseline for energy consumption. This involves collecting data on the university building's energy consumption over a specified time period. This baseline will help you comprehend the building's energy consumption and potential areas for improvement.

After establishing a baseline, Management should establish objectives for energy procurement. For instance, staff may seek to increase the proportion of renewable energy sources used by the building or to decrease its total energy consumption. Evaluate procurement options with objectives in mind, management can evaluate the various energy procurement options. This may involve negotiating a renewable energy contract with an energy supplier or investing in on-site renewable energy generation, such as solar panels.

Implement procurement strategy Once a procurement strategy has been selected, it can be implemented. This could entail the installation of renewable energy infrastructure, the signature of a new energy contract, or the implementation of energy efficiency measures to reduce total energy consumption.

Finally, it is essential to monitor and measure your progress towards achieving your energy procurement objectives. This will help you determine whether your strategy is effective and identify areas where adjustments may be necessary.

By following these steps and implementing the BS EN ISO 50001 standard, contactor can ensure that Alex building acquires energy in a sustainable and cost-effective manner

Libraries can explore various procurement options to enhance their energy efficiency. Potential solutions involve implementing energy-efficient lighting and HVAC systems, adding insulation and weather stripping,

HVAC systems represent a significant portion of energy consumption in buildings such as libraries, which feature expansive areas that necessitate both heating and cooling. Older HVAC systems tend to have lower efficiency and higher energy consumption compared to modern, energy-efficient models.

By implementing more energy-efficient HVAC systems, libraries can decrease their energy usage, leading to substantial cost savings in the long run. Energy-efficient HVAC systems are designed to consume less energy and operate more efficiently. This not only helps in reducing energy costs but also contributes to a sustainable future by reducing the carbon footprint of the library.

There exist multiple alternatives for acquiring HVAC systems that are energy efficient. Libraries have the option to either buy new systems outright or opt for leasing them for a certain duration. Numerous vendors specialize in offering energy-efficient HVAC systems and can assist libraries in selecting the optimal system for their particular requirements.

Libraries may consider additional energy-saving measures to further decrease their energy consumption, alongside upgrading to more energy-efficient HVAC systems. As an illustration, one could incorporate programmable thermostats, which aid in optimizing HVAC system efficiency by modifying temperature settings according to occupancy patterns. Sensors can be installed to automatically switch off lights and HVAC systems when a room is vacant.

3.1 Conclusion:

In conclusion, a thorough risk assessment is an important step for a university to take in order to find and reduce possible dangers and risks that could affect its staff, students, and assets. During the evaluation process, a number of possible risks, such as natural disasters, cyberattacks, security breaches, and public health emergencies, were found and assessed.

During the review, a number of ways to reduce risk were found. These included making buildings safer, improving IT security systems, and putting in place emergency plans. It is also important for the university to keep teaching staff and students about best practises for risk management and to build a mindset of safety and understanding.

Even though it is impossible to fully get rid of all risks, the risk assessment gives the university useful information and advice on how to deal with possible risks and keep everyone safe. By reviewing and changing the risk assessment on a regular basis, the university can keep getting better at managing risks and making the community safer and more secure.

Implementing an energy management system that conforms to the BS EN ISO 50001 standard is a highly effective way for universities to improve their energy efficiency and reduce their environmental impact. Throughout the energy management and procurement process, a range of strategies were employed to reduce energy consumption, such as improving building insulation, upgrading HVAC systems, and installing energy-efficient lighting.

The BS EN ISO 50001 standard provided a structured framework for the energy management process, which ensured that all aspects of the university's energy use were comprehensively addressed. The energy procurement route also allowed the university to take advantage of energy savings opportunities, such as negotiating better rates with suppliers and utilizing renewable energy sources. By implementing an energy management system that adheres to the BS EN ISO 50001 standard, the university can not only reduce its energy costs and environmental impact, but also enhance its reputation as a responsible and sustainable institution. The continued monitoring and optimization of the energy management system will ensure that the university remains at the forefront

of energy management best practices and continues to achieve maximum energy efficiency in its buildings.

4.1 References:

- [1] Iqbal S, Choudhry RM, Holschemacher K, Ali A, Tamošaitienė J. Risk management in construction projects. Technological and economic development of economy. 2015 Jan 2;21(1):65-78.
- [2] Britain G. Regulatory Reform (Fire Safety) Order 2005. TSO; 2005.
- [3] Meacham BJ. Risk-informed performance-based approach to building regulation. Journal of Risk Research. 2010 Oct 1;13(7):877-93.
- [4] Fire and Rescue Services Act 2004 [Internet]. Legislation.gov.uk. 2015 [cited 2023 May 10]. Available from: <https://www.legislation.gov.uk/ukpga/2004/21/section/4>
- [5] Media I. New UWTSd art building to be opened | Wales Property News [Internet]. Insider Media Ltd. [cited 2023 May 10]. Available from: <https://www.insidermedia.com/news/wales/royal-visit-to-officially-open-new-uwtssd-building>.
- [6] Iso.org. 2020. Available from: <https://www.iso.org/obp/ui/#iso:std:iso:50001:ed-2:v1:en>
- [7] Dedelyuk KY. Energy project management system: benefits, principles and risks.

5.1 Appendix:

Risk matrix - use this to determine risk for each hazard i.e. 'how bad and how likely'				Likelihood of Harm		
Severity of Harm	Remote	Very unlikely	Unlikely	Possible	Likely	
Negligible e.g. small bruise	Very low	Very low	Very low	Low	Low	
Slight e.g. small cut, deep bruise	Very low	Very low	Low	Low	Medium	
Moderate e.g. deep cut, torn muscle	Very low	Low	Medium	Medium	High	
Severe e.g. fracture, loss of consciousness	Low	Medium	High	High	Extremely high	
Very Severe e.g. death, permanent disability	Low	Medium	High	Extremely high	Extremely high	

Table 5:Risk Matrix