Enlisted Surface Warfare Specialist (ESWS) Reactor Practice Test (Sample)

Study Guide

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Questions

1. What is a critical function of the CRW/RMO in reactor management?

A. Initiating reactor shutdown procedures

B. Supervising electrical systems

C. Ensuring the safe operation of valve systems

D. Monitoring fluid systems efficiency

2. In what areas is the REA responsible?

A. Only in instrumentation systems

B. Maintenance of the reactor control systems

C. Operation, care, and maintenance of reactor electrical and propulsion plant electrical systems

D. Financial management of reactor operations

3. Which of the following is not a type of air mentioned in the reactor practice test?

A. High Pressure Air

B. Ship Service Air

C. Control Air

D. Utility Air

4. What does the Ahead throttle valve control?

A. Moves the ship starboard

B. Moves the ship forward

C. Moves the ship to neutral

D. Moves the ship reverse

5. Which component is responsible for pumping gas within the A/C plants?

A. Chill water

B. Compressor

C. Reefers

D. Seawater

6. What is the physical pressure maintained by potable water pumps?

- **A. 60-80 psi**
- **B. 70-90 psi**
- **C. 80-100 psi**
- **D. 90-110 psi**

7. What does the REA stand for?

- **A. Reactor Electrical Assistant**
- **B. Reactor Engineering Authority**
- **C. Radiation Exposure Analyst**
- **D. Reactor Environmental Advisor**

8. What is the pressure range for high-pressure air compressors (HPACs)?

- **A. 1000-2000 psi**
- **B. 2000-3000 psi**
- **C. 3500-4200 psi**
- **D. 4000-5000 psi**

9. What is the function of MMR in a ship's reactor?

- **A. To control weather conditions during voyages**
- **B. To use ship's steam for propulsion, power generation, and water production**
- **C. To manage fuel supply for ship operations**
- **D. To monitor crew performance during operations**

10. What is the purpose of the de-aerating feed tank?

- **A. To store emergency fuel reserves**
- **B. To remove air from the water and preheat it**
- **C. To collect waste products from the propulsion system**
- **D. To cool down the steam after it leaves the turbine**

Answers

1. D
2. C
3. D
4. B
5. B
6. C
7. A
8. C
9. B
10. B

Explanations

1. What is a critical function of the CRW/RMO in reactor management?

A. Initiating reactor shutdown procedures

B. Supervising electrical systems

C. Ensuring the safe operation of valve systems

D. Monitoring fluid systems efficiency

The critical function of the CRW (Chemical and Radiological Warfare)/RMO (Radiation Management Officer) in reactor management revolves around monitoring fluid systems efficiency. This role is vital because efficient fluid systems ensure the proper cooling of the reactor core, which is essential for maintaining safe operation and preventing overheating. The CRW/RMO is responsible for observing and analyzing the performance of various fluid systems, including coolant circulation and containment integrity, to ensure they function within safe parameters. By closely monitoring these systems, they can detect any anomalies that may indicate potential issues, thereby upholding safety and operational standards in a reactor environment. Their expertise in this area is crucial for the overall effectiveness and safety of reactor management.

2. In what areas is the REA responsible?

A. Only in instrumentation systems

B. Maintenance of the reactor control systems

C. Operation, care, and maintenance of reactor electrical and propulsion plant electrical systems

D. Financial management of reactor operations

The selected answer highlights the responsibilities of the Reactor Electrician (REA) in ensuring the operation, care, and maintenance of reactor electrical and propulsion plant electrical systems. This is a critical role because the REA is integral to maintaining the safety and efficiency of the reactor and its electrical components. The REA must possess a deep understanding of how the electrical systems interact with reactor operations, including monitoring and troubleshooting any issues that arise. This encompasses everything from routine inspections and preventative maintenance to ensuring that systems are operationally ready during drills and actual operations. Proper functioning of these electrical systems is essential for the overall safety and performance of the propulsion plant and reactor. In contrast, the other options focus on narrower or unrelated aspects. For instance, being responsible only for instrumentation systems does not encompass the full breadth of the REA's responsibilities, which include both power generation and distribution for propulsion. Maintenance of reactor control systems, while important, is just one aspect of the broader scope that includes electrical systems. Lastly, financial management of reactor operations is outside the technical scope of the REA's duties, as this role primarily involves hands-on technical skills rather than financial oversight. Thus, the focus on the comprehensive operation and maintenance of reactor electrical systems in the correct response aligns perfectly with

3. Which of the following is not a type of air mentioned in the reactor practice test?

A. High Pressure Air

B. Ship Service Air

C. Control Air

D. Utility Air

The correct answer highlights that Utility Air is not a type of air typically referenced in reactor operations. In the context of naval reactor systems, various types of air are utilized for specific purposes critical to the operation and safety of the reactor. High Pressure Air refers to air that is compressed to a high pressure for various machinery and operational needs, while Ship Service Air is used for non-critical systems and applications aboard the ship, often applicable for tools and equipment. Control Air is essential for operating control systems in a reactor environment, particularly those pertaining to valves and other mechanisms that require precise functioning. Utility Air, although it may exist in various forms on ships for general purposes, is not classified under the specific types of air utilized in reactor operations, which is where the distinction comes into play. The types of air mentioned in reactor contexts are clearly defined due to their roles in ensuring the safety and functionality of reactor systems, whereas Utility Air serves a broader, less specific role.

4. What does the Ahead throttle valve control?

A. Moves the ship starboard

B. Moves the ship forward

C. Moves the ship to neutral

D. Moves the ship reverse

The Ahead throttle valve primarily controls the flow of steam to the main propulsion turbines, which in turn regulates the speed of the ship in a forward motion. When the Ahead throttle valve is opened, more steam is directed to the turbines, resulting in increased power and thrust that propels the ship forward. This mechanism is crucial for maneuvering and achieving the desired speed while navigating. Understanding the function of the Ahead throttle valve is essential for operating the ship effectively. It allows for precise adjustments in speed, which can be critical during various stages of navigation, including docking and avoiding obstacles. While other options might pertain to different aspects of ship operation, the Ahead throttle valve specifically pertains to forward movement, making it the correct choice in this context.

5. Which component is responsible for pumping gas within the A/C plants?

A. Chill water

B. Compressor

C. Reefers

D. Seawater

The compressor is a crucial component in any air conditioning (A/C) system, including those used onboard naval vessels. It serves the primary function of compressing the refrigerant gas, thereby raising its pressure and temperature. This process facilitates the movement of the refrigerant through the various stages of the cooling cycle. In the context of A/C plants, after the compressor adds energy to the refrigerant, it transforms the refrigerant from a low-pressure gas to a high-pressure gas. This compressed gas then moves to the condenser, where it dissipates heat and transforms into a liquid before being cycled back to the evaporator, where the cooling effect occurs. Chill water refers to water that has been cooled for use in air conditioning but is not responsible for pumping gas. Reefers, which are refrigeration units, play a role in maintaining temperature for perishable goods but don't serve as the main component for gas movement within the A/C system. Seawater, while often used in various cooling processes, does not act as a medium for pumping gas in the A/C plants. Thus, understanding the function of the compressor is key to grasping how air conditioning systems operate and the vital role it plays in managing onboard climate control.

6. What is the physical pressure maintained by potable water pumps?

A. 60-80 psi

B. 70-90 psi

C. 80-100 psi

D. 90-110 psi

Potable water pumps are designed to deliver water at a pressure that ensures adequate flow while maintaining the integrity of the system. The pressure range of 80-100 psi is suitable for potable water systems as it provides enough force to deliver water efficiently throughout the ship or installation without risking damage to the pipes or fixtures. This pressure range is also compatible with various plumbing fixtures and water distribution systems, ensuring reliable service and proper functioning of the water supply system. While other pressure ranges could theoretically function in some systems, the selected range is the standard that ensures reliability and effectiveness in a variety of scenarios. Differences in pressure outside this range could either lead to inadequate water supply or, conversely, excess pressure that may cause leaks or failures in the water distribution system.

7. What does the REA stand for?

A. Reactor Electrical Assistant

B. Reactor Engineering Authority

C. Radiation Exposure Analyst

D. Reactor Environmental Advisor

The correct interpretation of REA in the context of reactor operations is "Reactor Electrical Assistant." This term typically refers to a role focused on assisting with the electrical systems associated with nuclear reactors. The Reactor Electrical Assistant is responsible for supporting the operation and maintenance of electrical systems that interface with the reactor's operations, ensuring that these systems function properly and effectively contribute to the safety and efficiency of reactor functionality. This role is crucial in the context of reactor operations, as electrical systems are integral to control functions, safety mechanisms, and overall reactor management. Understanding the responsibilities associated with this position is important for personnel involved in surface warfare and nuclear operations, as it encompasses key aspects of reactor safety and performance. Other options refer to different concepts or roles that may not align as specifically with the responsibilities tied to reactor electrical operations. For example, terms like Reactor Engineering Authority or Radiation Exposure Analyst suggest different focuses within reactor operations that are not primarily related to the electrical aspects.

8. What is the pressure range for high-pressure air compressors (HPACs)?

A. 1000-2000 psi

B. 2000-3000 psi

C. 3500-4200 psi

D. 4000-5000 psi

The correct answer reveals that high-pressure air compressors (HPACs) typically operate within the range of 3500 to 4200 psi. This range is significant because it aligns with the operational requirements of various systems on naval vessels, particularly for maintaining necessary air pressure for different applications, such as starting engines or acting as a power source for specific pneumatic systems. Operating at 3500 to 4200 psi allows these compressors to deliver enough pressure to perform effectively in environments where high pressure is vital. This includes supporting the compressed air needs for torpedoes, underwater lathes, and other machinery that requires this level of pressure to function correctly. The design and operation of HPACs are meant to ensure reliability and efficiency within this pressure range, ensuring optimal performance when called upon during various operational scenarios. The other pressure ranges mentioned do not accurately reflect the capabilities and operational specifications of HPACs, which is why they are not considered valid answers. Understanding the right pressure range is crucial for ensuring proper maintenance and safe operation of these systems on naval vessels.

9. What is the function of MMR in a ship's reactor?

A. To control weather conditions during voyages

B. To use ship's steam for propulsion, power generation, and water production

C. To manage fuel supply for ship operations

D. To monitor crew performance during operations

The function of the Main Machinery Room (MMR) in a ship's reactor is fundamentally related to the generation and management of power and steam. The MMR is responsible for utilizing the ship's steam not only for propulsion but also for power generation and the production of fresh water. This is essential for the overall operation of the ship, as steam generated in the reactor can drive turbines that propel the ship through the water, generate electrical power to support onboard systems, and can also be used in desalination processes to produce potable water for the crew. Proper operation of the MMR is crucial for efficiency and sustainability during a voyage, as it ensures that the ship maintains the necessary operational capabilities, including propulsion and power for various systems, while also addressing the crew's basic needs for water. Understanding the role of the MMR is vital for anyone working in or studying naval engineering and operations.

10. What is the purpose of the de-aerating feed tank?

A. To store emergency fuel reserves

B. To remove air from the water and preheat it

C. To collect waste products from the propulsion system

D. To cool down the steam after it leaves the turbine

The purpose of the de-aerating feed tank is to remove air from the water and preheat it. In a marine propulsion system, especially in nuclear reactors, the presence of dissolved gases, like oxygen and nitrogen, in the feedwater can lead to corrosion and other problems within the boiler system. The de-aerating feed tank is designed to address this issue by allowing steam to be injected into the water, which helps to strip out the dissolved gases. By preheating the water as part of the process, the system also improves the efficiency of the steam generation process, as less energy is required to turn the water into steam when it is already at a higher temperature. This preheating step helps to optimize overall system performance, ensuring that the reactor operates efficiently and safely. This function is critical for maintaining the integrity and longevity of the components involved in the water-steam cycle of nuclear propulsion systems, making the de-aerating feed tank an essential part of the system's design.