

GAS MANAGEMENT

Computer Based Training Module Available on NANTel



ABSTRACT

This CBT is a self paced, detailed, comprehensive, nuclear industry generic overview of the Gas Management issues from NRC Generic Letter 2008-01. It includes design, surveillance, licensing, and operating experience related to gas management.



INTENDED AUDIENCE

1. Experienced nuclear plant mechanical engineers who are developing expertise in Gas Management
2. Site engineering Managers or Supervisors



DURATION

- 2.5 hours
- An additional 8-12 hours for reading materials provided within the CBT

TERMINAL LEARNING OBJECTIVES

1. Describe common gas intrusion operating experiences that led to the creation of formal Gas Management programs at commercial nuclear generation stations as defined in Generic Letter 2008-01.
2. Examine the applicable regulatory requirements for Gas Management at commercial nuclear generation stations as defined in Generic Letter 2008-01.
3. Describe the safety implications that inadequate Gas Accumulation Management can have at commercial nuclear generation stations (Generic Letter 2008-01).
4. Given a gas accumulation scenario, identify the scope of responsibility for engineering, systems, maintenance, and operations to identify, manage, and correct the gas accumulation issue.
5. Given P&IDs, piping physical and isometric drawings, and walkdown data, identify systems, components, and locations susceptible to gas accumulation based on the guidance of Generic Letter 2008-01 and NEI 09-10.
6. Diagnose potential gas accumulation locations and determine the potential consequences of gas accumulation at the location.
7. Describe methods for gas accumulation prevention and the typical physical modifications, procedural changes, and surveillance changes since the issuance of Generic Letter 2008-01 to address gas intrusion concerns.
8. Identify mitigating actions or controls to effectively manage gas accumulation.
9. Evaluate the potential for gas movement by determining the Froude Number.
10. Identify the computer programs/analytical tools available for instances when more detailed analysis of gas accumulation locations is required.
11. Explain common methods for measuring gas accumulation and the technical specification requirements for Gas Accumulation Management as described in TSTF-523.
12. Describe the current NRC concerns and previously cited violations associated with gas intrusion.
13. Compare NEI 09-10 and the NRC Final Safety Evaluation for NEI 09-10 to assemble a comprehensive understanding of how industry guidance has shaped the NRC's expectations for Gas Management.
14. Describe the tools, techniques, recommended good practices, and mistakes to avoid for completing walkdowns to survey potential locations for gas accumulations.
15. Describe "inaccessible" locations and the accepted methods for minimizing gas accumulation at these locations consistent with safety analysis and technical specification limits.
16. Apply the methods for gas accumulation prevention and the typical physical modifications, procedural changes, and surveillance changes since the issuance of Generic Letter 2008-01 to identify when future plant modifications have the potential to challenge the

- modifications that have been made to address Gas Management issues.
17. Describe gas intrusion mechanisms and unusual plant evolutions which may result in gas accumulation issues.
 18. Develop mitigating actions and recommended inspections and surveillance to proactively manage potential gas accumulation for unusual or infrequent plant evolutions which may result in gas management issues.
 19. Apply the underlying physics behind proper fill and vent procedures to be able to analyze situations where specific plant configurations or components can challenge the proper filling and venting of a system.
 20. Apply FAI/08-70, WCAP-17276, NEI 09-10, and the Final Safety Evaluation for NEI 09-10 to evaluate the potential effects of a void on the suction side and the discharge side of a pump.
 21. Apply the gas monitoring guidance provided in NEI 09-10 to track and trend gas management issues.
 22. Explain potential gas accumulation concerns for operability/functionality determinations.

KEY INDUSTRY DOCUMENTS

1. NRC Generic Letter 2008-01 (ML072910759)
2. NEI_09-10_ML13136A129
3. NRC-FSE_ML12342A379
4. INPO Significant Operating Experience Report 97-1
5. INPO Significant Event Report 2-05, Rev. 1
6. NRC Inspection Manual, Temporary Instruction 2515/177, Rev1 (ML100261300)
7. NRC Information Notice 2011-17_ML11161A111
8. Technical Specifications Task Force TSTF-523, Rev. 2, Improved Standard Technical Specifications Change Traveler, "Generic Letter 2008-01, Managing Gas Accumulation"
9. WCAP-17276-NP, Rev. 1, Investigation of Simplified Equation for Gas Transport
10. FAI/08-70, Rev. 1, Gas-Void Pressure Pulsation Program, Fauske & Associates, September 2008 and Erratum to FAI/08-70, Rev. 1