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## APPENDIX A – REFERENCES

### Part A - USNRC Regulatory Documents

#### 1 Criteria and Regulations

- Atomic Energy Commission General Design Criteria  
Criteria 38, 39, 49
  
- U. S. Code of Federal Regulations  
Table 10 - Energy  
Part 50 - Domestic Licensing of Production Facilities  
Sections 10, 22, 23, 24, 36, 54, 55, 56, 57, 63, Appendix A & B  
Regulatory Guides
  - 1.108 - Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants
  - 1.118 - Periodic Testing of Electric Power and Power Protection Systems
  - 1.137 - Fuel-Oil Systems for Standby Diesel Generators
  - 1.155 - Station Blackout
  - 1.160 - Monitoring the Effectiveness of Maintenance at Nuclear Power Plants
  - 1.29 - Seismic Design Classification
  - 1.32 - Criteria for Safety Related Electric Power Systems for Nuclear Power Plants
  - 1.6 - Independence Between Redundant Standby (Onsite) Power Sources
  - 1.75 - Physical Independence of Electric Systems
  - 1.89 - Environment Qualifications of Certain Electric Equipment to Safety for Nuclear Power Plants
  - 1.9 - Selection, Design, Qualification, and Testing of Emergency Diesel Generator Units
  - 1.93 - Availability of Electric Power Sources

### Part B - Categorical References and Case Histories

#### 1. Diesel Engine - Mechanical Failures and Design Issues

- 10CFR21-0095 Report, 2008-10-21  
Defective Ingersol-Rand Series 89 Air Start Motors
  
- Information Notice 2008-05  
Fires Involving Emergency Diesel Generator Exhaust Manifolds (FM OPs)

- Information Notice 2007-27  
Recurring Events Involving Emergency Diesel Generator Operability (Various)
  - 10CFR21 Report, 2007-04-09  
FM OP Diesel Engine Cam Roller Bushing Failures (Incorrect Material Hardness)
  - 10CFR21 Reports, 2006-12-22 and 2007-01-08  
New Woodward Governor Digital Reference Unit (DRU) Setup to Address Unevaluated Failure Mode
  - 10CFR21 Report, 2006-06-13  
Defective Nordberg EDG Valve Seat Inserts (Improper Size Inserts May Drop from Head into Cylinder)
  - 10CFR21 Report, 2005-09-16  
Falling Isoprene EDG Governor Drive Couplings on Transamerica DeLaval EDGs at 6 Nuclear Power Plants
  - Information Notice 98-43  
Leaks in the Emergency Diesel Generator Lubricating Oil and Jacket Cooling Water Piping
  - Information Notice 97-41  
Potentially Undersized EDG Oil Coolers
2. Emergency Diesel Generator - Electrical and Controls Related Failures
- Information Notice 2010-23  
Malfunctioning EDG Speed Switch Circuits
  - Information Notice 2010-09  
Importance of Understanding Circuit Breaker Control Power Indications
  - Information Notice 2007-36  
Emergency Diesel Generator Voltage Regulator Problems
  - Information Notice 2007-09  
(EDG) Service Equipment Operability under Degraded Voltage Conditions
  - 10CFR21 Report, 2006-12-16  
EDG MCC Circuit Breaker Design Set Point Low (Loss of Cooling Fans, etc, for SACM EDG)

- 10CFR21 Report, 2005-04-12  
Defective Woodward Governor Compensating-Type EG Series Actuators (Null Voltage Shift)
  - 10CFR21 Report, 2004-04-23 and 2006-01-23  
Defective IC Chips in Some Woodward Governor DRUs May Result in Erratic Speed Control
3. Emergency Diesel Generator Failures Resulting from Maintenance/ Painting/ Cleaning/ Miscellaneous
- Information Notice 2009-14  
(Painting Activities, Cleaning Agents Render EDGs and Other Systems Inoperable)
  - Information Notice 98-41  
Spurious Shutdown of Emergency Diesel Generators from Air Start Design Oversight
4. Site Switchyard, Electrical Distribution Issues (Including Aging)
- Information Notice 2010-26  
(Failures in Submerged Electrical Cables)
  - Information Notice 2009-10  
(Large) Transformer Failures - Recent Operating Experience
  - Generic Letter 2007-01  
(Underground Power Cable Failures that Disable Accident Mitigation Systems)
  - Information Notice 2005-20  
(Site Electrical Distribution Failures)
  - Information Notice 2005-04  
(Single Point Vulnerability of Redundant Electrical Safety Buses to Fire and Failure)
  - Information Notice 2004-19  
Problems with Back-Up Power Supplies of Emergency Response Facilities

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## 5. Fires and Fire Protection Issues Potentially Affecting Emergency Systems

- Information Notice 2007-23  
Inadvertent Discharge of Halon 1301™ Fire Suppression System (Incorrect or Outdated Procedures)
  
- Information Notice 2007-19  
Fire Protection Equipment Recalls and Counterfeit Notices
  
- Information Notice 2007-17  
Fires at Nuclear Power Plants Involving Fire Protection Administration and Design Controls
  
- Information Notice 2005-32  
Product Alert for Fire Hydrants (Hardened, Corrosive Grease Issue)
  
- Information Notice 2002-27  
Recent Fires at Commercial Nuclear Power Plants
  
- Information Notice 99-28  
Recall of Star Brand Fire Protection Sprinkler Heads
  
- Information Notice 99-05  
Inadvertent Discharge of CO<sub>2</sub> Fire Protection System and Gas Migration (63 Deaths Since 1975)
  
- Information Notice 97-82  
Inadvertent Halon Fire Suppression System Actuation Due to a Camera Flash
  
- Information Notice 97-72  
Potential for Failure of Omega Series Sprinkler Heads

## 6. Grid Reliability and Potential Impact on Nuclear Power Plants

- Generic Letter 2006-02  
Grid Reliability, Risk Assessment, NPP-TSO Communications, Maintenance Schedule Considerations
- Information Notice 2006-06  
Loss of Offsite Power and Station Blackout More Probable during Summer
- Information Notice 2005-16  
(LOOP 3-Unit Trip)

## 7. Fuel Oil and Lubricating Oil Issues

- Information Notice 2009-02  
Biodiesel in Fuel Oil Could Adversely Impact Diesel Engine Performance

- Information Notice 2006-22  
Potential Impact of Ultra-Low Sulfur Diesel Fuel on Diesel Engines
- Information Notice 96-67  
Vulnerability of EDGs to Fuel Oil/Lubricating Oil Incompatibility

### **PART C - U.S. Nuclear Regulation Commission Publications**

1. Regulatory Guide 1.9, Rev. March 2007.
2. A Reliability Program for Emergency Diesel Generators at Nuclear Power Plants, NUREG/CR-5078, Vol. 2, Prepared by Science Applications International Corporation and Sandia National Laboratories, Pub. By USNRC.
3. NRC Inspection Manual, Part 9900, Technical Guidance Degraded Conditions, Operability, et.al; NUREG 0800, Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants.
4. Performance of Emergency Diesel Generators in Restoring Power to Their Associated Safety Busses - A Review of Events Occurring at Power Plants, AEOD-591-01.
5. NRC Inspection Manual, Inspection Procedure 71707, Operational Safety Verification.
6. NRC Inspection Manual, Inspection Procedure 17710, Engineered Safety Feature Walkdown.
7. NRC Inspection Manual, Inspection Procedure 62703, Monthly Maintenance Observation.
8. NRC Inspection Manual, Inspection Procedure 61726, Surveillance Observation.
9. NRC Inspection Manual, Inspection Procedure 2515/93, Inspection for Verification of Quality Assurance Requests Regarding Diesel Generator Fuel Oil Multi-plant Action Item A-15.
10. Operating History Overview for Diesel Generators in Nuclear Service, USNRC Report AEOD/P401, February, 1984

### **PART D - Commercial Codes, Standards, and Publications**

IEEE Standard Criteria for Diesel Generator Units Applies as Standby Power Supplies for Nuclear Power Generating Stations, IEEE Standard 387-1995, Pub. By The Institute of

Electrical Engineers, Inc., New York, NY 10017

1. IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations, IEEE Standard 323-1983. Pub. By The Institute of Electrical Engineers, Inc., New York, NY 10017.
2. Standard Fuel Specifications for Diesel Fuel Oils, ASTM Designation D 975-93, Pub. By American Society for Testing and Materials, Philadelphia, PA 19103.
3. Standard Test Method for Sulfur in Petroleum Products (High Temperature Method), ASTM Designation D 1552-930 Pub. By American Society for Testing and Materials, Philadelphia, PA 19103.

Commercial codes and standards are available on the appropriate IEEE, ASMT, etc. websites

### Part E - Books and Manuals

1. Diesel Engineering Handbook, Karl W. Stinson, M.E.; Pub. by Business Journals Inc., Norwalk, CT 06855; 1980.
2. Fundamentals of Diesel Engines - U.S. Navy, NAVPERS; Pub. by Standards of Curriculum, Division Training, Bureau of Naval Personnel; 1951.
3. Diesel and High Compression Gas Engines, E. J. Kates and W. E. Luck, Pub. by American Technical Publishers, Inc., Alsip, IL 60658; 1974.
4. Principles of Energy Conversion, Archie W. Culp, Jr.; Pub. by McGraw-Hill Book Company; 1979.
5. Electric MACHINERY - The Dynamics and Statics of Electromechanical Energy Conversion, A. E. Fitzgerald and Charles Kingsley; Pub. by McGraw-Hill Book Company.
6. Standard Test Method for Particulate Contaminates in Aviation Fuel by Line Sampling, ASTM Designation D 2276-93; Pub by American Society for Testing and Materials, Philadelphia, PA 19103.
7. Standard Practice for Manual Sampling of Petroleum and Petroleum Products; ASTM Designation D 4057-88; Published by American Society for Testing and Materials, Philadelphia, PA 19103.
8. Standard Test Method for Free Water and Particulate Contamination in Distillate Fuels (Visual Inspection Procedures); ASTM Designation D 4176-93; Published by American Society for Testing and Materials, Philadelphia, PA 19103.

9. Guidelines for the Utilization of Commercial Grade Items in Nuclear Safety Related Applications (NCIG-07) EPRI Report NP-5652, Final Report, June 1988; Pub by Electric Power Research Institute, Palo Alto, CA 94304.
10. Diagnostic System Summary, Predictive Maintenance-Condition Monitoring Integration; Pub. by Electric Power Research, Eddystone, PA.