
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

APR1400 Design Certification

Korea Electric Power Corporation / Korea Hydro & Nuclear Power Co., LTD

Docket No. 52-046

RAI No.: 468-8574

SRP Section: 09.05.08 – Emergency Diesel Engine Combustion Air Intake and Exhaust System

Application Section:

Date of RAI Issue: 04/22/2016

Question No. 09.05.08-4

In response to RAI 127-8010, Question 09.05.08-1, the applicant stated that the emergency diesel engine combustion air intake and exhaust system (EDECAIES) is designed in accordance with Diesel Engine Manufacturers Association (DEMA) code. However, in the proposed revised description, the applicant provided generically that system components and piping are tested per "manufacturer's standard for safety-related items". Furthermore, the DEMA code was last revised in 1972, and DEMA is no longer an active association.

The applicant is requested to clarify and/or confirm the specific standard or code used in designing the EDECAIES.

Response

In the EDECAIES, exhaust piping is Quality Group G and designed in accordance with the requirements of ASME B31.1, "Power piping". Intake air duct work is Quality Group G and is designed in accordance with ASME AG-1. Also, diesel engine, engine-mounted components, and generator are Quality Group G and designed in accordance with IEEE 387.

The quality assurance requirements for procurement, fabrication, and installation of Quality Group G items are in accordance with Quality Class Q, safety-related requirements.

DCD Tier 2, Table 3.2-1 will be revised to reflect the above description.

Since system components and piping open to the atmosphere need not be tested in accordance with ASME B31.1, the sentence for a pressure test in DCD Tier 2, Subsection 9.5.8.4 will be revised to reflect above description.

Impact on DCD

DCD Tier 2, Table 3.2-1(24 of 86) and Subsection 9.5.8.4 will be revised as indicated on the attached markup.

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

There is no impact on the Technical Specifications.

Impact on Technical/Topical/Environmental Reports

There is no impact on any Technical, Topical, or Environmental Report.

APR1400 DCD TIER 2

Table 3.2-1 (24 of 86)

ASME AG-1 - 2009

Item No. / Principal SSCs	Location ⁽²⁾	Safety Class	Quality Group	Codes and Standards	10 CFR 50, App. B ⁽³⁾	Seismic Category	Remarks
d. Expansion tanks	AB, EDGB	SC-3	C	ASME Sec. III ND-2007 with 2008 addenda	Yes	I	
e. Combustion air intake and exhaust duct work	AB, EDGB	SC-3	G	DEMA - 1972	Yes	I	
f. Engine, engine-mounted components, and generator	AB, EDGB	SC-3	G	DEMA - 1972	Yes	I	
g. Starting air compressors, air dryer package, lube oil separator, lube oil/preheating water heat exchanger, HT water electric heater, preheating HT water pump, prelube oil pump and other non-safety-related equipment	AB, EDGB	NNS	D	ASME Sec. VIII-2007 with 2008 addenda	A	II	(3)(d)
h. Non-safety-related piping and equipment located at outdoor	AB, EDGB	NNS	D	ASME B31.1-2010	N/A	III	
26. DI – Display							
a. QIAS-N display	AB	NNS	N/A	N/A	A	I	
b. IPS display	AB	NNS	N/A	N/A	A	II	(3)(d)
27. DO – Diesel Fuel Oil Transfer							
a. Diesel fuel oil storage tanks	AB, EDGB	SC-3	C	ASME Sec. III ND-2007 with 2008 addenda	Yes	I	
b. Diesel fuel oil transfer pumps	AB, EDGB						
1) Pumps		SC-3	C	ASME Sec. III ND-2007 with 2008 addenda	Yes	I	
2) Motors		SC-3	N/A	IEEE-323-2003/344-2004/334-2006	Yes	I	

IEEE-387-1995

i. Exhaust piping	AB, EDGB	SC-3	G	ASME B31.1-2010	Yes	I	
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under accident conditions, assuming a single active component failure. The four trains of the EDG provide reasonable assurance that a single active failure in an EDECAIES does not lead to a loss of more than one EDG and therefore, independence and redundancy requirements of onsite ac power supplies are met. The duct for room ventilation air is separate from that for the EDECAIES. The system provides combustion air directly from the outside to the diesel engine. The combustion intake opening is located at a minimum of 6.10 m (20 ft) above grade level to minimize the intake of dust in the EDG room. The diesel exhaust gases are discharged to the atmosphere in a direction away from the outside air inlet with sufficient separation to minimize the effects of exhaust gas drift to the outside air inlet.

The safety-related portion of the EDECAIES provides an adequate quantity of combustion air and an exhaust path for the diesel engine during engine operation condition.

The quality and properties of the intake air are monitored to provide reasonable assurance that the engine will function in all ambient conditions.

The EDECAIES is initially tested prior to initial operation. Periodic inspection and functional testing are also performed along with the complete EDG system in accordance with the Technical Specifications.

Hydrogen and nitrogen gases are stored at a sufficient distance from the EDG room so that there is no threat to the proper operation of the diesel engines under an accidental release of hydrogen or nitrogen gases.

9.5.8.4 Inspection and Testing Requirements

~~System components and piping are tested to pressures designated by ASME Section III Class 3 (Reference 49).~~ Inspection and functional testing are performed prior to initial operation as described in Section 14.2; thereafter, the system is periodically tested along with the complete EDG system in accordance with the Technical Specifications as described in Chapter 16. This testing demonstrates the performance of leaktightness, operability, and the capability of the system to function as intended under accident condition.

Piping is inservice inspected in accordance with the requirements of ASME Section XI (Reference 50).

Intake air duct is tested in accordance with ASME AG-1 (Reference 84).

APR1400 DCD TIER 2

- 79. Regulatory Guide 1.137, "Fuel Oil Systems for Nuclear Power Plant," Rev. 3, U.S. Nuclear Regulatory Commission, June 2013.
- 80. Regulatory Guide 1.32, "Criteria for Power Systems for Nuclear Power Plant," Rev. 3, U.S. Nuclear Regulatory Commission, March 2004.
- 81. NFPA 101, "Life Safety Code," National Fire Protection Association, 2012.

84. ASME AG-1-2009, "Code on Nuclear Air and Gas Treatment," The American Society of Mechanical Engineers, 2009.