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GE Hitachi Nuclear Energy

MFN 15-088
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Attention:

Lawrence E. Kokajko, Director
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Subject: Input To Regulatory Analysis for the Performance-Based Emergency Core Cooling Systems Cladding Acceptance Criteria (Title 10 of the Code of Federal Regulations Section 50.46c) Draft Final Rule

In Reference 1, the NRC offered GE-Hitachi Nuclear Energy Americas LLC (GEH) the opportunity to provide the NRC with information on the costs for implementing Title 10 of the Code of Federal Regulations (10 CFR) Section 50.46c rulemaking. The enclosure to this letter provides the GEH response to this request.

The cost input information is provided in terms of labor hours and capital or one-time costs. The estimates should be considered best-estimate, no contingency or conservatism was added. It is the opinion of GEH that the labor hourly rates in the Reference 1 tables are low by 10 to 20%. The table in Enclosure 1 generally follows the subjects in the Reference 1 table. However, a few subjects were added. These estimates include only those hours and costs that would be incurred by GEH or Global Nuclear Fuel. Costs associated with licensee activities such as the licensee cost for the preparation of license amendments as well as review fees and the cost associated with requests for additional information responses are not included.

If you have any questions regarding the enclosed comments, please contact me or Phil Sharpe (910-819-1896).

Sincerely,

James F. Harrison
Vice President, Fuel Licensing
Regulatory Affairs
GE-Hitachi Nuclear Energy Americas LLC

Project No. 710

Reference:

1. Letter from Lawrence E. Kokajko (NRC) to Jerald G. Head (GEH), Subject: Input to Regulatory Analysis for the Performance-Based Emergency Core Cooling Systems Cladding Acceptance Criteria (Title 10 of the Code of Federal Regulations Section 50.46c) Draft Final Rule, September 11, 2015.

Enclosure:

1. Input to Regulatory Analysis for the Performance-Based Emergency Core Cooling Systems Cladding Acceptance Criteria (Title 10 of the Code of Federal Regulations Section 50.46c) Draft Final Rule, Non-Proprietary Information – Class I (Public)

cc: J. Golla (NRC)
A. Bone (NRC)
B.R. Moore (GNF)
J.G. Head (GEH)
P.L. Campbell (GEH)

ENCLOSURE 1

MFN 15-088

Input to Regulatory Analysis for the Performance-Based Emergency
Core Cooling Systems Cladding Acceptance Criteria (Title 10 of the
Code of Federal Regulations Section 50.46c) Draft Final Rule

Non-Proprietary Information – Class I (Public)

	Number	Hours	Capital	Comment
Specification and drawing changes				Category not in NRC estimate
Labor (Sr. Engineer)		50		
Total		50		Not in NRC estimate
High Temperature Steam Oxidation Chamber				
Equipment Cost			\$200,000	
Installation/Comissioning - Facility (Technician)		20	\$20,000	
Qualification/Comissioning - Labor (Technician)		50		
Total		70		
Develop Breakaway Oxidation test and write procedures				
Identify key parameters (Sr. Engineer)		150		e.g. liner removal, scratches, cleaning procedure
Test at min & max parameters (20% Sr. Engineer / 80% Technician)		250		
Document test procedures hours (Sr. Engineer)		50		
Total		450		
Initial Breakaway Oxidation testing to support specified analytical limit				
No. of labor hours to conduct one oxidation test		3		
No. of tests to determine time and temp for 1 material lot (including duplicates) (10% Sr. Engineer / 90% Technician)	32	96		Covers 650 - 1050C @ 50C interval, one @ 25C, three reductions in time @ 500s interval, one at 250s
No. of test for multiple lots (including duplicates) (10% Sr. Engineer / 90% Technician)	630	1890		30 lots for statistics, each 3 or 4 tests times, average 3.5; three temperatures each
Documentation and analysis of data for setting limit (Sr. Engineer)		200		
Total	662	2186		

	Number	Hours	Capital	Comment
Confirmatory Breakaway Oxidation testing - One year				
Sample gathering and preparation (Technician)		50		
No. of tests (including duplicates) (Technician)	100	300		50 ingots per year
Documentation and reporting (Sr. Engineer)		50		
Total		400		
Topical reports on Breakaway Ox				
No. of labor hours to issue Topical report (Sr. Engineer)		250		
Licensing, Admin, and Project Management		40		
Total		290		
Topical reports on Hydrogen Models, and Fuel Mechanical design				
Revise GESTAR (Sr. Engineer)		50		Assuming default H model is given in RG; hours are for GESTAR revision
Licensing, Admin, and Project Management		50		
Total		100		
Hydrogen Content Measurement Device				
			\$20,000	For modifications/improvements to existing equipments for charging/measurement and RCT
H measurement cost @ \$200 per sample			\$10,000	Triplicate (per DG-1263), 4 H levels, 3 ECR per H level, 40% overage for cherry picking H level
Hydrogen Pre-Charging				
H charging labor (Sr. Engineer)		50	\$0	included in modifications and improvements to existing equipment
Total		50		4 H levels (per DG-1263), Not in NRC estimate

	Number	Hours	Capital	Comment
			\$0	included in modifications and improvements to existing equipment
Ring Compression Test Device				
RCT labor @ 3hr per test, includes sample prep and documentation (Sr. Engineer)		144		Triplicate (per DG-1263), 4 H levels, 3 ECR per H level, 4 ECR for uncharged
Total		144		Not in NRC estimate
Grand Total for breakaway oxidation and PQD testing (Initial setup and first year)		3740	\$250,000	
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Topical reports on BWR and PWR Evaluation Models				
SAFER Supplement		600		
Licensing, Admin, and Project Management		80		
TRACG LOCA Addendum		450		
Licensing, Admin, and Project Management		40		
Total		1170		
Licensee Amendment Request for 50.46c compliance, Level 1				
PCT margin plants with SAFER	14	160		
(LAR support for licensees, funded by each licensee with GNF product)				
Licensing, Admin, and Project Management	14	20		
Total		2520		

	Number	Hours	Capital	Comment
Licensee Amendment Request for 50.46c compliance, Level 2				
LOCA-limited plants with SAFER (LAR support for licensees)	6	200		
(LAR support for licensees, funded by each licensee with GNF product)				
Licensing, Admin, and Project Management	6	20		
Total		1320		
Licensee Amendment Request for 50.46c compliance, Level 3				
presume implement compliance in BWR/2 TRACG LOCA (NMP1 only)		160		
Total		160		
Grand Total for EM/LAR Support:		5170		