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**Fred Dacimo**  
Vice President  
License Renewal

NL-10-013

January 14, 2009

ATTN: Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

**SUBJECT:** License Renewal Application – Supplement to SAMA Reanalysis Using Alternate Meteorological Tower Data  
Indian Point Nuclear Generating Unit Nos. 2 and 3  
Docket Nos. 50-247 and 50-286  
License Nos. DPR-26 and DPR-64

**REFERENCE:** 1. Entergy Nuclear Operations Inc. Letter NL-09-165, "SAMA Using Alternate Meteorological Tower Data" dated December 11, 2009.

Dear Sir or Madam:

In Reference 1 above, Entergy Nuclear Operations, Inc (Entergy) provided results of a SAMA reanalysis using alternate meteorological data.

The purpose of this letter is to provide additional, clarifying information related to the SAMA reanalysis to answer questions raised during a teleconference between Entergy and NRC on January 7, 2010.

- 1) Summaries of the revised implementation cost estimates for IP2 SAMAs 17 and 40 and IP3 SAMAs 17, 20, 40, and 50 are attached. The estimates are similar to the estimate provided in response to request for additional information 5I.
- 2) With the revised population dose and offsite economic costs resulting from the SAMA reanalysis described in the referenced letter, the total present dollar-value equivalent benefit associated with completely eliminating severe accidents caused by internal events is about \$4.5 million for IP2 and \$5.1 million for IP3. Use of a multiplier of 3.8 for IP2 and 5.5 for IP3 to account for

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external events increases the value to \$17 million for IP2 and \$28 million for IP3 and represents the dollar value benefit associated with completely eliminating the risk of severe accidents caused by all internal and external events at IP2 and IP3, respectively.

- 3) The revised SAMA implementation cost estimates presented in the referenced letter do not include replacement power costs.

The revised SAMA implementation cost estimates do not include a markup to account for inflation. However, the revised estimates were developed using Entergy's standard process for development of conceptual level project estimates utilizing spreadsheets containing 2009 rates for material, labor, insurance, fees, etc. Since the original implementation estimates were developed prior to 2009, the new estimates inherently account for inflation since the time of the earlier estimates.

There are no new commitments identified in this submittal. If you have any questions, or require additional information, please contact Mr. Robert Walpole at 914-734-6710.

Sincerely,



FD/mb

Attachment: 1. License Renewal Application – Summaries of Revised SAMA Implementation Cost Estimates

cc: Mr. S. J. Collins, Regional Administrator, NRC Region I  
Mr. J. Boska, Senior Project Manager, NRC, NRR, DORL  
Mr. Sherwin E. Turk, NRC Office of General Counsel, Special Counsel  
Ms. Kimberly Green, NRC Safety Project Manager  
NRC Resident Inspectors Office, Indian Point  
Mr. Paul Eddy, NYS Dept. of Public Service  
Mr. Francis J. Murray, Jr., President and CEO, NYSERDA

# ATTACHMENT 1 TO NL-10-013

## License Renewal Application – Summaries of Revised SAMA Implementation Cost Estimates

**INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3  
 LICENSE RENEWAL APPLICATION  
 SUPPLEMENT TO SAMA REANALYSIS**

**IP2 SAMA 17 Implementation Cost Estimate**

*The SAMA improvement would be to develop a new modification that would provide an additional stainless steel barrier to protect the containment liner from ejected core debris at high pressure. This modification would require extensive design work to create the modification package. The associated design calculations include seismic analysis, loading analysis, and possible associated analysis for piping or penetration interferences.*

*Specific issues to be addressed for this modification include the following.*

- 1) *Change licensing basis, which may require Nuclear Regulatory Commission involvement.*
- 2) *Modify or provide new floor loading calculation, seismic analysis, and reactor building volume calculation.*
- 3) *Revise procedures and training.*
- 4) *Install and test the new barrier.*
- 5) *Change various documents, i.e. Technical Specification Basis, Final Safety Analysis Report, system descriptions, design basis documents, preventative maintenance tasks.*
- 6) *Change safety analysis calculations.*

*The following is a breakdown of the cost estimate.*

| <b>Task Description</b>   | <b>Cost \$</b>                                      |
|---|---|
| <i>Develop modification documents, including calculations and drawings</i>                                  | <i>377,824</i>                                      |
| <i>Procedure changes and training</i>   | <i>12,188</i>                                       |
| <i>Installation, material and labor</i>   | <i>2,364,167</i>                                    |
| <i>Safety related cost increase i.e. quality assurance, quality control, material increase, etc.</i>        | <i>192,969</i>                                      |
| <i>Project management / modification support</i>  | <i>495,767</i>                                      |
| <i>Installer mobilization, tools and training, construction management fee, insurance, performance bond</i> | <i>680,779</i>                                      |
| <i>Installation contingency considering lack of design details</i>  | <i>465,426</i>                                      |
| <i>Indirect charges (loaders)</i>   | <i>841,467</i>                                      |
| <i>Total</i>  | <i>5,430,587<br/>(rounded<br/>to<br/>5,500,000)</i> |

**IP2 SAMA 40 Implementation Cost Estimate**

The SAMA improvement would be to install bypasses around the existing atmospheric dump valves to depressurize the reactor coolant system. This would allow successful low pressure emergency core cooling system injection following a small loss of coolant accident and high pressure safety injection failure. This modification would require extensive design work to create the modification package. The associated design calculations would include seismic analysis, loading analysis, setpoint calculations, environmental qualification (EQ) calculations, and possible associated analysis for piping interferences.

Specific issues to be addressed for this modification include the following.

- 1) Change licensing basis, which may require Nuclear Regulatory Commission involvement.
- 2) Modify or provide new seismic analysis, loading analysis, setpoint calculations and EQ datasheets.
- 3) Revise procedures and training.
- 4) Install and test the new hardware.
- 5) Change various documents, i.e. Technical Specification Basis, Final Safety Analysis Report, system descriptions, design basis documents, preventative maintenance tasks.
- 6) Change simulator and associated procedures.
- 7) Change safety analysis calculations.

The following is a breakdown of the cost estimate.

| <b>Task Description</b>  | <b>Cost \$</b>                                  |
|--|---|
| Develop modification documents, including calculations and drawings                                  | 299,250   |
| Procedure changes and training   | 25,000  |
| Installation, material and labor   | 360,000   |
| Safety related cost increase i.e. quality assurance, quality control, material increase, etc         | 178,500   |
| Project management / modification support  | 89,250  |
| Installer mobilization, tools and training, construction management fee, insurance, performance bond | 178,500   |
| Installation contingency considering lack of design details  | 476,000   |
| Indirect charges (loaders)   | 321,300   |
| <b>Total</b>   | <b>1,927,800<br/>(rounded to<br/>2,000,000)</b> |

**IP3 SAMA 17 Implementation Cost Estimate**

The SAMA improvement would be to increase secondary side pressure capacity to reduce the frequency of steam generator tube rupture events and decrease the likelihood of relief valves lifting and subsequently failing to reseal. It was assumed based on engineering judgment that the nuclear steam supply system vendor would not be able to qualify the existing components to a high enough pressure rating to meet the intent of the SAMA. Therefore, the steam generators, piping from the feedwater regulating valves through the steam generators and up to the main steam isolation valves, feedwater regulators and main steam isolation valves would have to be replaced with upgraded components. The associated instrumentation would also have to be upgraded.

The associated design calculations would include seismic analysis, loading analysis, setpoint calculations, EQ calculations, and possible associated analysis for piping interferences.

Specific issues to be addressed for this modification include the following.

- 1) Change licensing basis, which may require Nuclear Regulatory Commission involvement.
- 2) Modify or provide new seismic analysis, loading analysis, setpoint calculations and EQ datasheets.
- 3) Revise procedures and training.
- 4) Install and test the new hardware.
- 5) Change various documents, i.e. Technical Specification Basis, Final Safety Analysis Report, system descriptions, design basis documents, preventative maintenance tasks.
- 6) Change simulator and associated procedures.
- 7) Change safety analysis calculations.

The following is a breakdown of the cost estimate.

| <b>Task Description</b>  | <b>Cost \$</b>                                     |
|--|--|
| Develop modification documents, including calculations and drawings                                  | 51,458,750   |
| Procedure changes and training   | 25,000   |
| Installation, material and labor   | 330,000,000  |
| Safety related cost increase i.e. quality assurance, quality control, material increase, etc         | 99,517,500   |
| Project management / Modification Support  | 49,758,750   |
| Installer mobilization, tools and training, construction management fee, insurance, performance bond | 99,517,500   |
| Installation contingency considering lack of design details  | 265,380,000  |
| Indirect charges (loaders)   | 179,131,500  |
| <b>Total</b>   | <b>1,074,789,000</b><br>(shown as<br>>100,000,000) |

**IP3 SAMA 20 Implementation Cost Estimate**

The SAMA improvement would be to develop a new modification that would provide redundant and diverse limit switches to each containment isolation valve. This modification would provide additional indications of valve position by monitoring the valve position with one of two different instruments, which would improve the reliability or availability of the indication. This modification would require extensive design work to create the modification package. The associated design calculations would include seismic analysis, loading analysis, loop error calculations, setpoint calculations, EQ calculations, and possible associated analysis for safe shutdown.

Specific issues to be addressed for this modification include the following.

- 1) Change licensing basis, which may require Nuclear Regulatory Commission involvement.
- 2) Modify or provide new seismic analysis, setpoint calculations, limit and torque switch settings, EQ datasheets.
- 3) Revise procedures and training.
- 4) Install and test the new instrument loops.
- 5) Change various documents, i.e. Technical Specification Basis, Final Safety Analysis Report, system descriptions, design basis documents, preventative maintenance tasks.
- 6) Change simulator and associated procedures.
- 7) Change safety analysis calculations.

The following is a breakdown of the cost estimate.

| <b>Task Description</b>  | <b>Cost \$</b>                            |
|--|---|
| Develop modification documents, including calculations and drawings                                  | 741,191                                   |
| Procedure changes and training   | 35,500                                    |
| Installation, material and labor   | 1,469,816                                 |
| Safety related cost increase i.e. quality assurance, quality control, material increase, etc.        | 125,980                                   |
| Project management / modification support  | 302,738                                   |
| Installer mobilization, tools and training, construction management fee, insurance, performance bond | 270,762                                   |
| Installation contingency considering lack of design details  | 377,663                                   |
| Indirect charges (loaders)   | 594,921                                   |
| <b>Total</b>   | 3,918,571<br>(rounded<br>to<br>4,000,000) |

**IP3 SAMA 40 Implementation Cost Estimate**

The SAMA improvement would be to provide automatic nitrogen backup to the steam generator atmospheric dump valves. For each of the four atmospheric dump valves, the modification would use existing nitrogen at the panel and would tie into the instrument air supply using a regulator and check valves in both the nitrogen and IA lines to prevent back feed. A local pressure gage, low pressure switch to the nitrogen line and an alarm in control room would also be required. The associated design calculations would include setpoint calculations, EQ calculations, and possible associated analysis for piping interferences.

Specific issues to be addressed for this modification include the following.

- 1) Change licensing basis, which may require Nuclear Regulatory Commission involvement.
- 2) Modify or provide new setpoint calculations and EQ datasheets.
- 3) Revise procedures and training.
- 4) Install and test the new hardware.
- 5) Change various documents, i.e. Technical Specification Basis, Final Safety Analysis Report, system descriptions, design basis documents, preventative maintenance tasks.
- 6) Change simulator and associated procedures.
- 7) Change safety analysis calculations.

The following is a breakdown of the cost estimate.

| <b>Task Description</b>   | <b>Cost \$</b>                     |
|---|------------------------------------|
| <i>Develop modification documents, including calculations and drawings</i>                                  | 259,500                            |
| <i>Procedure changes and training</i>   | 25,000                             |
| <i>Installation, material and labor</i>   | 95,000                             |
| <i>Safety related cost increase i.e. quality assurance, quality control, material increase, etc</i>         | 0                                  |
| <i>Project management / modification support</i>  | 49,500                             |
| <i>Installer mobilization, tools and training, construction management fee, insurance, performance bond</i> | 99,000                             |
| <i>Installation contingency considering lack of design details</i>  | 264,000                            |
| <i>Indirect charges (loaders)</i>   | 158,400                            |
| <b>Total</b>  | 950,400<br>(rounded to<br>950,000) |



**IP3 SAMA 50 Cost Estimate**

The SAMA improvement would be to install secondary guard pipes up to the main steam isolation valves. This modification would require extensive design work to create the modification package. The associated design calculations would include thermal analysis, seismic analysis, setpoint calculations, EQ calculations, and possible associated analysis for piping interferences.

Specific issues to be addressed for this modification include the following.

- 1) Change licensing basis, which may require Nuclear Regulatory Commission involvement.
- 2) Modify or provide new thermal analysis, seismic analysis, setpoint calculations and EQ datasheets.
- 3) Revise procedures and training.
- 4) Install and test the new hardware.
- 5) Change various documents, i.e. Technical Specification Basis, Final Safety Analysis Report, system descriptions, design basis documents, preventative maintenance tasks.
- 6) Change simulator and associated procedures.
- 7) Change safety analysis calculations.

The following is a breakdown of the cost estimate.

| <b>Task Description</b>   | <b>Cost \$</b>                         |
|---|--|
| <i>Develop modification documents, including calculations and drawings</i>                                  | 1,847,750                              |
| <i>Procedure changes and training</i>   | 25,000                                 |
| <i>Installation, material and labor</i>   | 1,560,000                              |
| <i>Safety related cost increase i.e. quality assurance, quality control, material increase, etc</i>         | 895,500                                |
| <i>Project management / modification support</i>  | 447,750                                |
| <i>Installer mobilization, tools and training, construction management fee, insurance, performance bond</i> | 895,500                                |
| <i>Installation contingency considering lack of design details</i>  | 2,388,000                              |
| <i>Indirect charges (loaders)</i>   | 1,611,900                              |
| <b>Total</b>  | 9,671,400<br>(rounded to<br>9,671,000) |