

  
**MITSUBISHI HEAVY INDUSTRIES, LTD.**  
16-5, KONAN 2-CHOME, MINATO-KU  
TOKYO, JAPAN

April 28, 2010

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

Attention: Mr. Jeffrey A. Ciocco

Docket No. 52-021  
MHI Ref: UAP-HF-10126

**Subject: MHI's Response to US-APWR DCD RAI No. 545-4290 Rev. 1**

**References:** 1) "Request for Additional Information No. 545-4290 Revision 2, SRP Section: 04.03 – Nuclear Design, Application Section: 4.3," dated March 3, 2010

With this letter, Mitsubishi Heavy Industries, Ltd. ("MHI") transmits to the U.S. Nuclear Regulatory Commission ("NRC") a document entitled "Response to Request for Additional Information No.524-4020 Revision 1".

Enclosed are the responses to questions 48, 49, 51 through 53, 57, 62, 65 and 66 of the RAI contained within Reference 1. The responses to questions 50, 54 through 56, 58 through 61, 63 and 64 of this RAI had already provided as the 30-day response by MHI transmittal UAP-HF-10093.

As indicated in the enclosed materials, this document (Enclosure 2) contains information that MHI considers proprietary, and therefore should be withheld from public disclosure pursuant to 10 C.F.R. § 2.390 (a)(4) as trade secrets and commercial or financial information which is privileged or confidential. Non-proprietary versions of the documents are also being submitted in this package (Enclosure 3). In the non-proprietary versions, the proprietary information, bracketed in the proprietary versions, is replaced by the designation "[ ]".

This letter includes a copy of the proprietary version (Enclosure 2), a copy of the non-proprietary version (Enclosure 3) and the Affidavit of Yoshiki Ogata (Enclosure 1) which identifies the reasons MHI respectfully requests that all materials designated as "Proprietary" in Enclosure 2 be withheld from public disclosure pursuant to 10 C.F.R. § 2.390 (a)(4).

Please contact Dr. C. Keith Paulson, Senior Technical Manager, Mitsubishi Nuclear Energy Systems, Inc. if the NRC has questions concerning any aspect of the submittal. His contact information is below.

Sincerely,



Yoshiki Ogata  
General Manager- APWR Promoting Department  
Mitsubishi Heavy Industries, LTD.

DOB  
NRD

Enclosure:

1. Affidavit of Yoshiki Ogata
2. Response to Request for Additional Information No.545-4290 Revision 2  
(Proprietary version)
3. Response to Request for Additional Information No.545-4290 Revision 2  
(Non-proprietary version)

CC: J. A. Ciocco  
C. K. Paulson

Contact Information

C. Keith Paulson, Senior Technical Manager  
Mitsubishi Nuclear Energy Systems, Inc.  
300 Oxford Drive, Suite 301  
Monroeville, PA 15146  
E-mail: ck\_paulson@mnes-us.com  
Telephone: (412) 373-6466

## Enclosure 1

Docket No.52-021  
MHI Ref: UAP-HF-10126

### MITSUBISHI HEAVY INDUSTRIES, LTD.

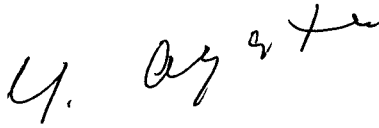
#### AFFIDAVIT

I, Yoshiki Ogata, being duly sworn according to law, depose and state as follows:

1. I am General Manager, APWR Promoting Department, of Mitsubishi Heavy Industries, Ltd ("MHI"), and have been delegated the function of reviewing MHI's US-APWR documentation to determine whether it contains information that should be withheld from public disclosure pursuant to 10 C.F.R. § 2.390 (a)(4) as trade secrets and commercial or financial information which is privileged or confidential.
2. In accordance with my responsibilities, I have reviewed the enclosed "Response to Request for Additional Information No.545-4290 Rev.2" and have determined that the document contains proprietary information that should be withheld from public disclosure. Those pages containing proprietary information are identified with the label "Proprietary" on the top of the page and the proprietary information has been bracketed with an open and closed bracket as shown here "[ ]". The first page of the document indicates that all information identified as "Proprietary" should be withheld from public disclosure pursuant to 10 C.F.R. § 2.390 (a)(4).
3. The information in the document identified as proprietary by MHI has in the past been, and will continue to be, held in confidence by MHI and its disclosure outside the company is limited to regulatory bodies, customers and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and is always subject to suitable measures to protect it from unauthorized use or disclosure.
4. The basis for holding the referenced information confidential is that it describes the unique methodology for evaluation to comply with Regulatory Guide 1.190, developed by MHI. This methodology was developed to significant cost to MHI, and with knowledge and know-how about using the DORT code.
5. The referenced information is being furnished to the Nuclear Regulatory Commission ("NRC") in confidence and solely for the purpose of supporting the NRC staff's review of MHI's Application for certification of its US-APWR Standard Plant Design.
6. Public disclosure of the referenced information would assist competitors of MHI in their design of new nuclear power plants without the costs or risks associated with the design of new fuel systems and components. Disclosure of the information identified as proprietary would therefore have negative impacts on the competitive position of MHI in the U.S. nuclear plant market.

I declare under penalty of perjury that the foregoing affidavit and the matters stated therein are true and correct to the best of my knowledge, information and belief.

Executed on this 28<sup>th</sup> day of April, 2010.

A handwritten signature in black ink, appearing to read "Y. Ogata". The signature is written in a cursive style with a large initial "Y" and a stylized "Ogata".

Yoshiaki Ogata,  
General Manager- APWR Promoting Department  
Mitsubishi Heavy Industries, LTD.

Docket No. 52-021  
MHI Ref: UAP-HF-10126

Enclosure 3

UAP-HF-10126  
Docket No. 52-021

Response to Request for Additional Information  
No. 545-4290 Revision 2

April, 2010  
(Non Proprietary)

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**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION**

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4/28/2010

**US-APWR Design Certification  
Mitsubishi Heavy Industries  
Docket No. 52-021**

**RAI NO.:** NO. 545-4290 REVISION 2  
**SRP SECTION:** 04.03 – Nuclear Design  
**APPLICATION SECTION:** 4.3  
**DATE OF RAI ISSUE:** 3/3/2010

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**QUESTION NO.: 04.03-48**

The Mitsubishi vessel fluence calculation methodology, described in Technical Report MUAP-09018, employs the BUGLE-96 nuclear data set in determining the attenuation of the neutron flux between the core and vessel. The 47-group cross sections in BUGLE-96 were collapsed using fine-group spectra for specific PWR/BWR basis-regions (e.g., the core barrel, thermal shield and vessel). [

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**ANSWER:**

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**Impact on DCD**

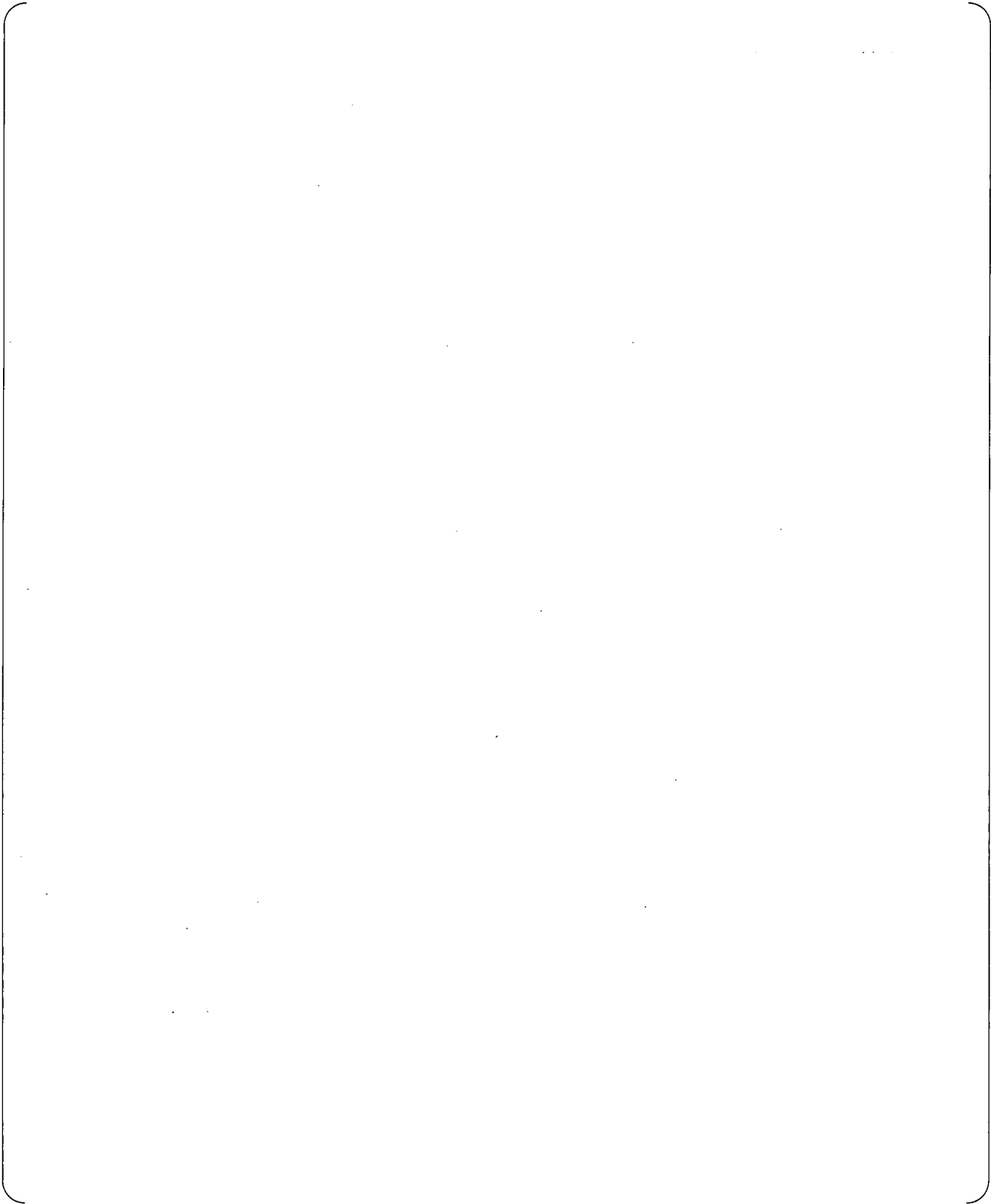
There is no impact on the DCD.

**Impact on COLA**

There is no impact on the COLA.

**Impact on PRA**

There is no impact on the PRA.





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**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION**

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4/28/2010

**US-APWR Design Certification  
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**QUESTION NO.: 04.03-49**

The neutron reflector has been introduced in the US-APWR design to provide needed fluence reduction at the azimuthal peak fluence location on the vessel (p. 26, Figure-8 of MUAP-09018). The array of water holes in the reflector geometry introduces a new complication in the transport of neutrons through the reflector. As a result, a detailed calculation is required to insure the neutron attenuation through the reflector is accurately determined.

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**ANSWER:**  
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**Impact on DCD**

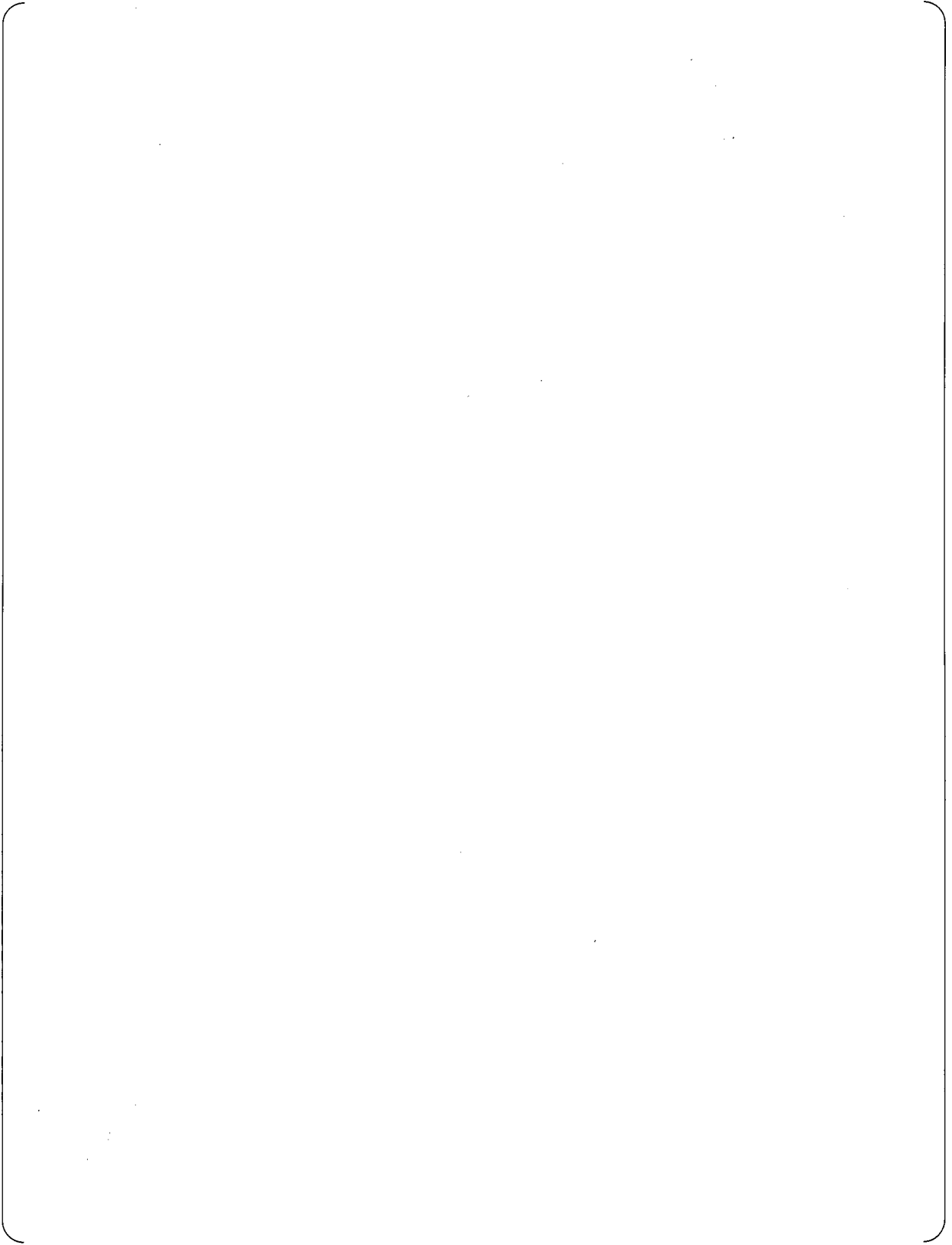
There is no impact on the DCD.

**Impact on COLA**

There is no impact on the COLA.

**Impact on PRA**

There is no impact on the PRA.



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**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION**

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**4/28/2010**

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SRP SECTION: 04.03 – Nuclear Design  
APPLICATION SECTION: 4.3  
DATE OF RAI ISSUE: 3/3/2010**

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**QUESTION NO.: 04.03-51**

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**ANSWER:**

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**Impact on DCD**

4.03-7

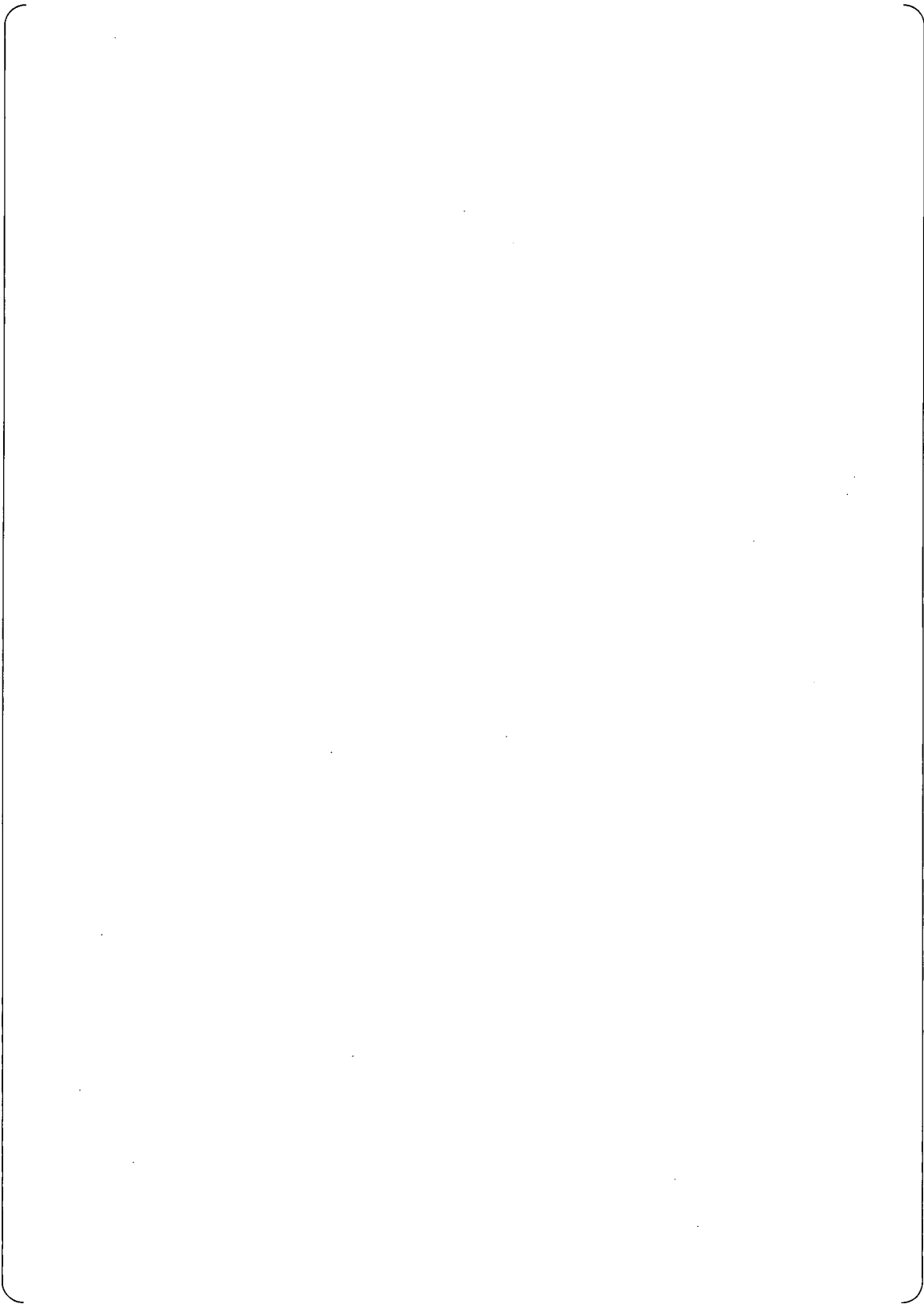
There is no impact on the DCD.

**Impact on COLA**

There is no impact on the COLA.

**Impact on PRA**

There is no impact on the PRA.



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4/28/2010

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**APPLICATION SECTION:** 4.3  
**DATE OF RAI ISSUE:** 3/3/2010

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**QUESTION NO.: 04.03-52**

In Appendix A Section A.2 of MUAP-09018, calculational approximations are identified, estimates of the resulting fluence uncertainty are calculated and the overall fluence uncertainty is determined (p. A-16, Table A-6). As stated in Regulatory Guide 1.190, each approximation should also be evaluated to determine the resulting bias (i.e., systematic error) introduced in the fluence prediction. These bias contributions should then be combined (with sign) to determine the resulting overall calculational bias. Provide an analysis of the fluence calculational bias.

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**ANSWER:**

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**Impact on DCD**

There is no impact on the DCD.

**Impact on COLA**

There is no impact on the COLA.

**Impact on PRA**

There is no impact on the PRA.



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**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION**

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**4/28/2010**

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**SRP SECTION: 04.03 – Nuclear Design**  
**APPLICATION SECTION: 4.3**  
**DATE OF RAI ISSUE: 3/3/2010**

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**QUESTION NO.: 04.03-53**

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**ANSWER:**

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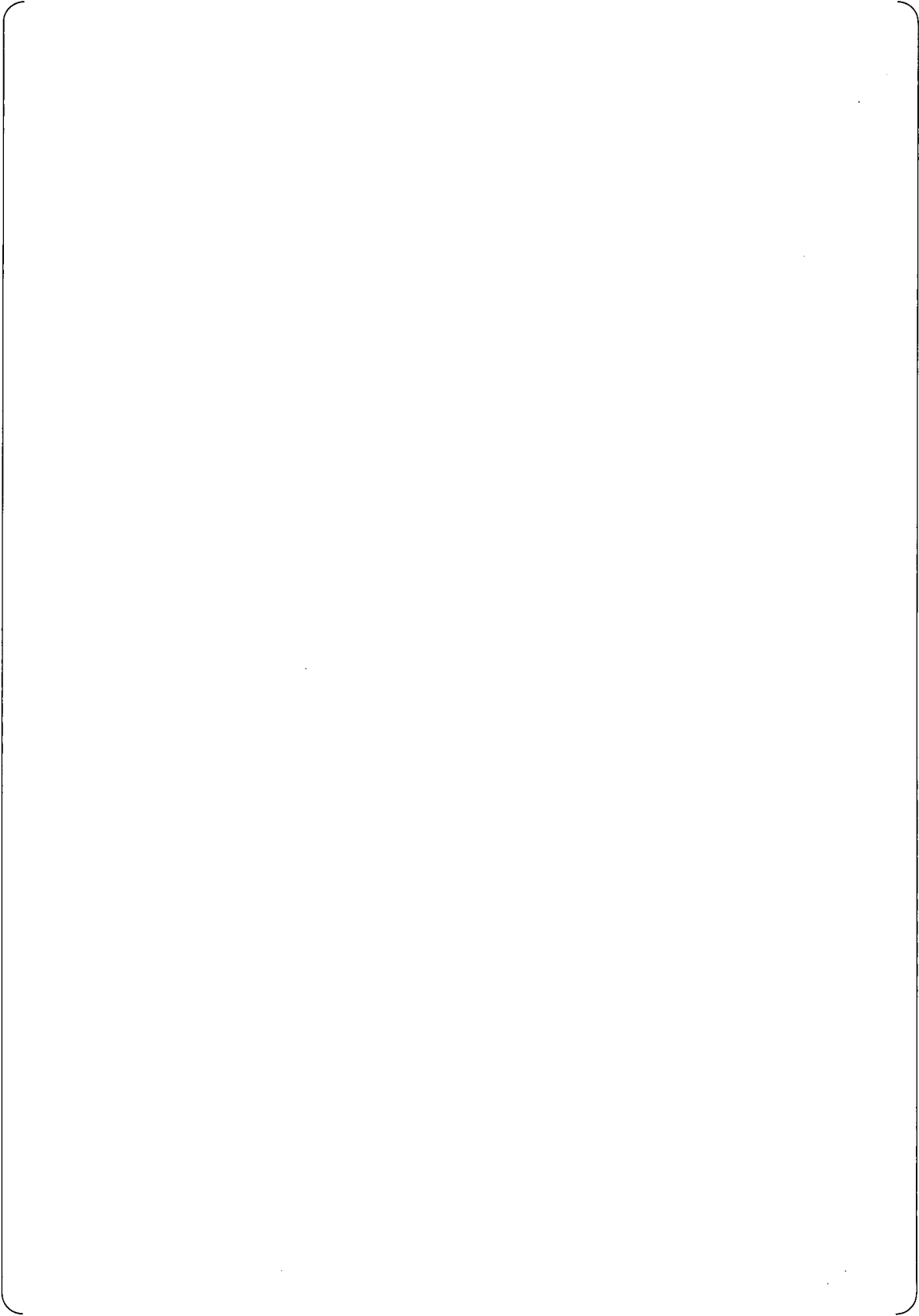
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**Impact on DCD**  
There is no impact on the DCD.

**Impact on COLA**  
There is no impact on the COLA.

**Impact on PRA**

There is no impact on the PRA.



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**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION**

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**4/28/2010**

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SRP SECTION: 04.03 – Nuclear Design  
APPLICATION SECTION: 4.3  
DATE OF RAI ISSUE: 3/3/2010**

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**QUESTION NO.: 04.03-57**

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**ANSWER:**

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**Impact on DCD**

There is no impact on the DCD.

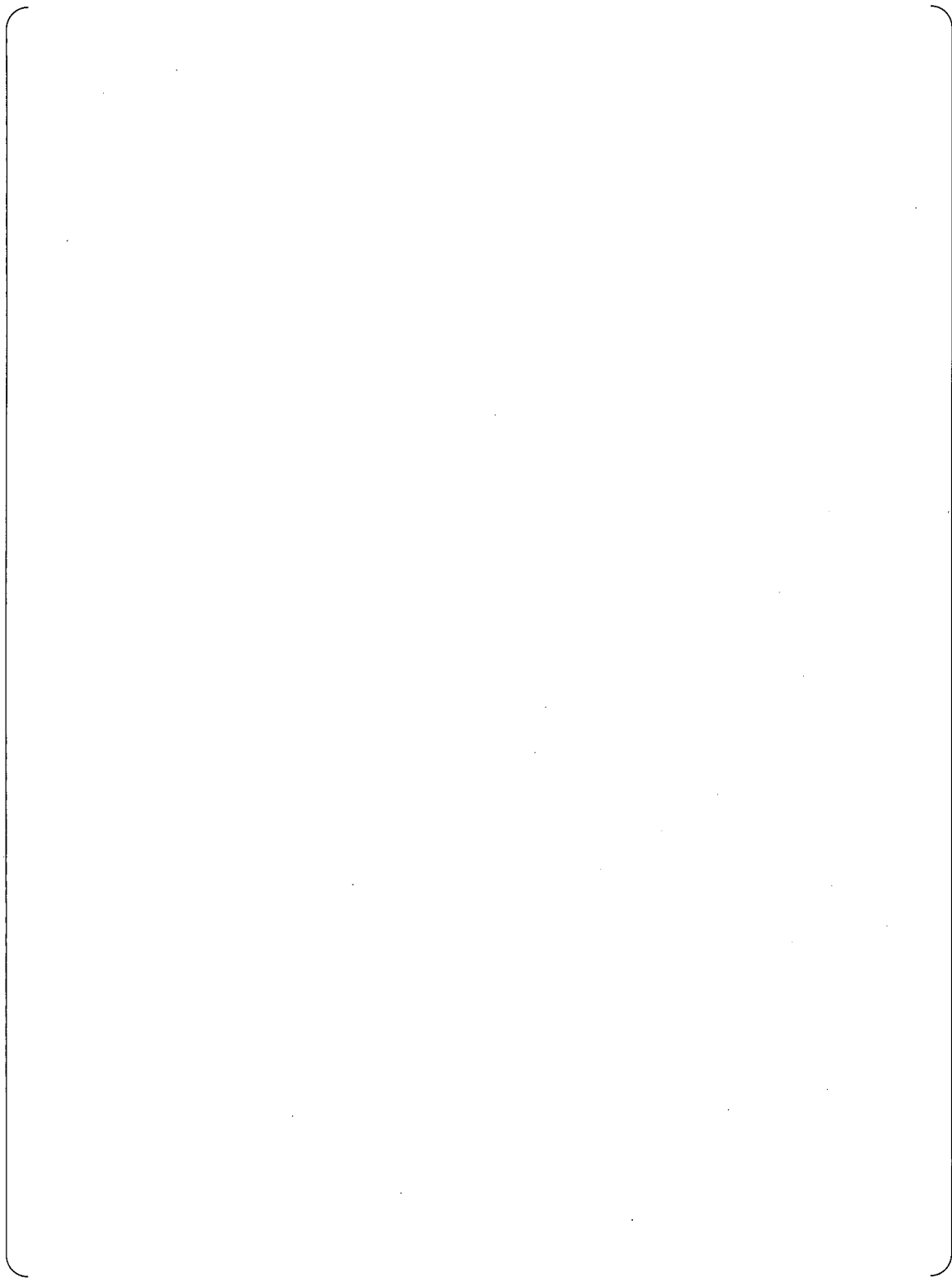
**Impact on COLA**

There is no impact on the COLA.

**Impact on PRA**

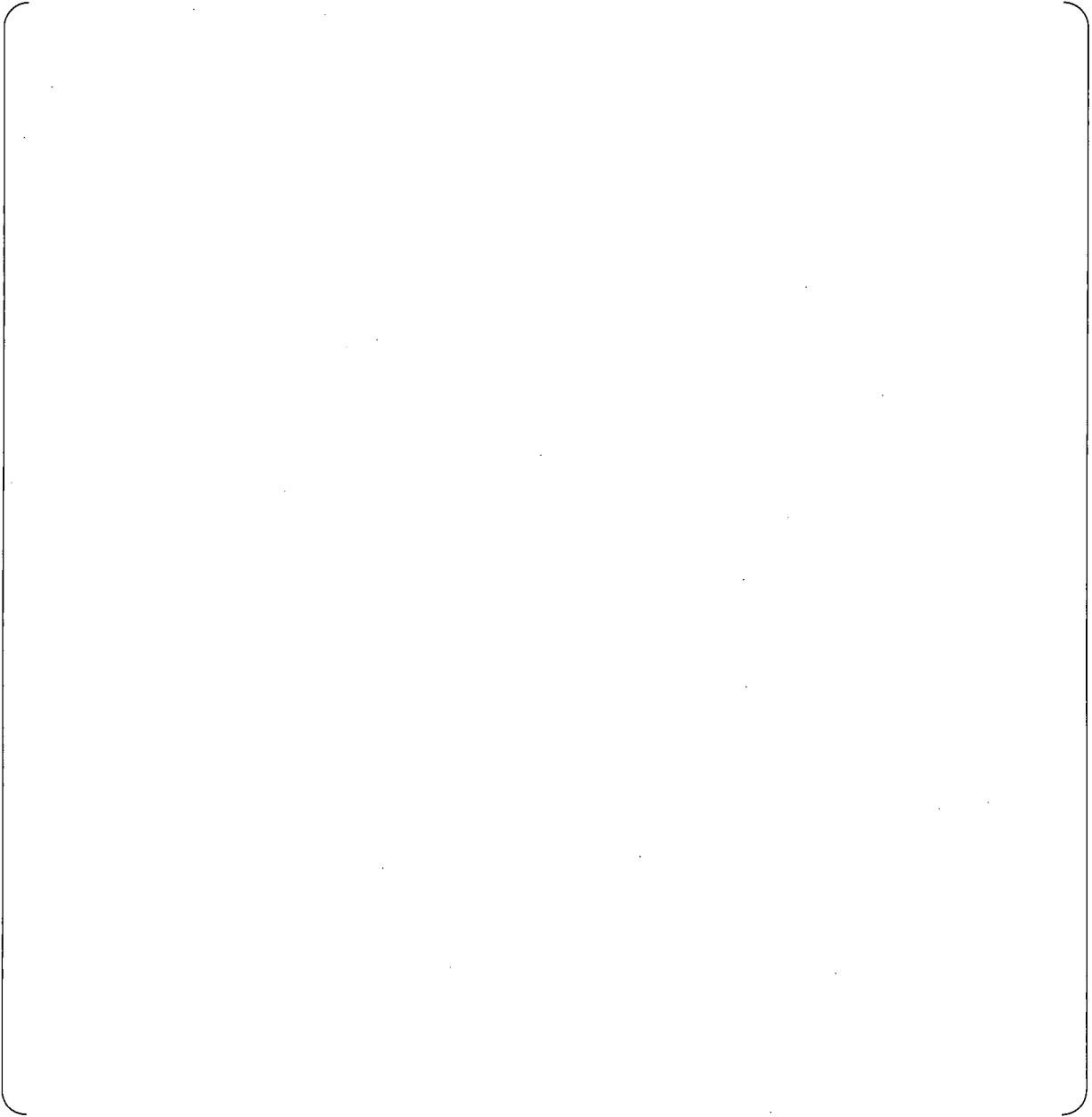
There is no impact on the PRA.













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4/28/2010

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**SRP SECTION: 04.03 – Nuclear Design**  
**APPLICATION SECTION: 4.3**  
**DATE OF RAI ISSUE: 3/3/2010**

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**QUESTION NO.: 04.03-62**

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**ANSWER:**

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**Impact on DCD**

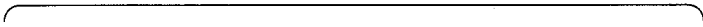
There is no impact on the DCD.

**Impact on COLA**

There is no impact on the COLA.

**Impact on PRA**

There is no impact on the PRA.



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**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION**

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4/28/2010

**US-APWR Design Certification  
Mitsubishi Heavy Industries  
Docket No. 52-021**

**RAI NO.:** NO. 545-4290 REVISION 2  
**SRP SECTION:** 04.03 – Nuclear Design  
**APPLICATION SECTION:** 4.3  
**DATE OF RAI ISSUE:** 3/3/2010

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**QUESTION NO.:** 04.03-65

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**ANSWER:**

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**Impact on DCD**

There is no impact on the DCD.

**Impact on COLA**

There is no impact on the COLA.

**Impact on PRA**

There is no impact on the PRA.





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**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION**

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4/28/2010

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**SRP SECTION: 04.03 – Nuclear Design**  
**APPLICATION SECTION: 4.3**  
**DATE OF RAI ISSUE: 3/3/2010**

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**QUESTION NO.: 04.03-66**

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**ANSWER:**

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**Impact on DCD**

There is no impact on the DCD.

**Impact on COLA**

There is no impact on the COLA.

**Impact on PRA**

There is no impact on the PRA.



