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

September 5, 2013

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

Attention: Mr. Perry Buckberg

Docket No. 52-021
MHI Ref: UAP-HF-13219

Subject: MHI's Revised Response to US-APWR DCD RAI No. 997-7033 (SRP 06.03)

References:
[1] "Request for Additional Information No. 997-7033 Revision 0, SRP Section: 06.03 – Emergency Core Cooling System –Application Section: 06.03 and 06.02.02." dated February 25, 2013 (ML13056A605).
[2] MHI Letter No. UAP-HF-13068, "Response to US-APWR DCD RAI No. 997-7033 Revision 0 (SRP 06.03)," dated March 25, 2013 (ML13087A297).

With this letter, Mitsubishi Heavy Industries, Ltd. ("MHI") transmits to the U.S. Nuclear Regulatory Commission ("NRC") a document entitled "Revised Response to Request for Additional Information No. 997-7033 ". MHI revised Reference 2 in response to NRC feedback regarding the designation of certain numerical values of debris as Tier 2* DCD content.

Enclosed is the revised response to Question 06.03-112 contained within Reference 1. This revised response supersedes the previous response to Question 06.03-112 in Reference 2.

Please contact Mr. Joseph Tapia, General Manager of Licensing Department, Mitsubishi Nuclear Energy Systems, Inc. if the NRC has questions concerning any aspect of this submittal. His contact information is provided below.

Sincerely,

Y. Ogata

Yoshiki Ogata,
Executive Vice President
Mitsubishi Nuclear Energy Systems, Inc.

Enclosure:

1. Revised Response to Request for Additional Information No. 997-7033

D081
NRO

CC: P. Buckberg
J. Tapia

Contact Information
Joseph Tapia, General Manager of Licensing Department
Mitsubishi Nuclear Energy Systems, Inc.
1001 19th Street North, Suite 710
Arlington, VA 22209
E-mail: joseph_tapia@mnes-us.com
Telephone: (703) 908 – 8055

Enclosure 1

UAP-HF-13219
Docket No. 52-021

Revised Response to Request for Additional Information
No. 997-7033

September 2013

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

9/5/2013

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI No.:	**997-7033**
SRP Section:	**06.03 – Emergency Core Cooling System**
Application Section:	**06.03 and 06.02.02**
DATE of RAI issue:	**02/25/2013**

QUESTION NO.: 06.03-112

RG 1.206 (June 2007) Regulatory Position, Part IV: Miscellaneous Topics, describes the following:

The creation of, and restrictions on, changing Tier 2* information resulted from the development of Tier 1 information for the advanced BWR design certification (Appendix A to 10 CFR Part 52) and the Asea Brown Boveri-Combustion Engineering System 80+ reactor design certification (Appendix B, "Design Certification Rule for the System 80+ Design," to 10 CFR Part 52). During this development process, these applicants requested that the agency minimize the amount of information in Tier 1 to allow additional flexibility for an applicant or licensee who references these appendices. Tier 2 also specified many codes, standards, and design processes that Tier 1 does not specify but that are acceptable for meeting ITAAC. As a result, certain significant information only exists in Tier 2, and the Commission does not want this significant information to be changed without prior NRC approval. The generic DCD identifies this Tier 2* information with italicized text and brackets.

NUREG-1792 "Final Safety Evaluation Report Related to Certification of the AP1000 Standard Plant Design", describes the following:

The ACRS review for the AP1000 highlighted the significance of certain assumptions about debris in containment to the adequacy of long-term core cooling, and a concern that the values not be revised without substantial additional testing and analysis. As a means of emphasizing this, the applicant proposed to designate the key information as Tier 2*, to require prior NRC approval, in a letter dated February 23, 2011. This change is included in Revision 19. The NRC agrees that this is a prudent change and will modify the final rule language to reflect this addition, as a Tier 2* item without expiration at fuel load.

(Note, in an amendment, dated December 2011, to Appendix D to Part 52 "Design Certification Rule for the AP1000 Design" the Tier 2* change was put into effect.)

Given the information provided in Technical Report MUAP-08013 "US-APWR Sump Strainer Downstream Effects," Revision 4 and containment debris limits in DCD Section 6.2.2 (as

modified by GSI-191 Tracking Report dated August 2012), it appears that the US-APWR is similar to the AP1000 regarding assumptions about debris in containment to the adequacy of long term core cooling, specifically the debris limits for core inlet blockage evaluations. Therefore, the NRC staff request that the applicant evaluate the appropriateness of applying Tier 2* designation to items associated with long term core cooling and/or the appropriateness of establishing a technical specification. If information related to long term core cooling is designated as Tier 2*, then the staff request the applicant to identify this information in the DCD to ensure that the appropriate change process and limits are followed.

ANSWER:

MHI proposes a Tier 2* item for containment debris in lieu of establishing a Technical Specification (TS) requirement. This action is based on regulatory precedence and an evaluation of the requirements of 10 CFR 50.36 related to the required content of TS.

Current NRC and industry guidance on the content of TS are incorporated into standard technical specifications (STS) which are published as a NUREG-series publication. STS were developed based on the criteria in the Final Commission Policy Statement on Technical Specification Improvements for Nuclear Power Reactors, dated July 22, 1993 (58 FR 39132). This policy statement was subsequently codified by changes to 10 CFR 50.36. These improved STS were the result of extensive technical meetings and discussions among the NRC staff, industry owners groups, vendors, and other stakeholders regarding the appropriateness of including specific requirements in TS. The TS in US-APWR DCD Tier 2 Chapter 16 are the result of the experience gained in the development of the improved STS.

The rule change that followed the issuance of NRC's policy statement on TS improvements provided the basis for many nuclear power plant licensees to relocate a number of existing TS requirements which do not fall within or satisfy the criteria 10 CFR 50.36 to other licensee-controlled documents. The NRC staff concluded that these "relocated" provisions were not related to dominant contributors to plant risk. Some of the relocated requirements were associated with containment cleanliness/foreign material exclusion requirements. NRC-approved STS do not include specific containment debris limits.

MHI has evaluated the appropriateness of including containment debris limits in TS and concludes that debris limits do not meet any of the four criteria for establishing TS limiting conditions for operation as provided under 10 CFR 50.36(c)(2)(ii). This position is consistent with that taken by the Westinghouse AP1000 design center and NRC staff comments made during the December 15, 2010 ACRS subcommittee meeting regarding AP1000 design certification.

According to 10 CFR 50.36(c)(2)(ii), a TS limiting condition for operation must meet one or more of the following criteria:

> *Criterion 1.* Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.

Criterion 1 relates to installed instrumentation, which does not apply to containment debris.

> *Criterion 2.* A process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

Criterion 2 applies to certain process variables, design features and operating restrictions that

are initial conditions of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier. Containment debris is neither a process variable nor a design feature. However, a containment debris limit could be considered an operating restriction, but it is not an explicit item identified in the design basis accident or transient analyses described in the DCD Chapter 15 safety analysis, which has been industry practice for consideration of inclusion into TS.

> *Criterion 3.* A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

Criterion 3 involves structures, systems and components, which does not apply to containment debris.

> *Criterion 4.* A structure, system, or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety.

Criterion 4 involves structures, systems and components, which does not apply to containment debris.

Therefore, no TS is proposed for containment debris limits.

Section 3 of Technical Report MUAP-08001-P, US-APWR Sump Strainer Performance, provides containment debris limits that are similar to debris parameters provided for the AP1000 design. MHI has determined that the limits for fiber and particle components of the latent debris, the miscellaneous debris, and the operational margin fiber loading should be designated as Tier 2* because these values represent the design basis of the testing used to support the long-term core cooling analyses for the US-APWR. Therefore, DCD Tier 2, Section 6.2.2.3.2, 6.2.2.3.3. 6.2.2.3.4 and Table 6.2.2-4, are revised to apply Tier 2* designation to these containment debris limits. In addition, DCD Tier 2, Chapter 1, Appendix 1A, Table 1A-1, is revised to include a summary, expiration, and location of this Tier 2* information. The relevant debris limits are specified as Tier 2* without expiration at fuel load. Although these limits are subject to change, any such change will require prior NRC approval in accordance with the change process specified in the US-APWR design certification rule. COL item 6.2(5) is also revised to remove the specific debris limit values and instead refer to the limits in Table 6.2.2-4.

MHI has reviewed other GSI-191 design/debris inputs and assumptions for consideration as Tier 2* information. However, their relative importance does not rise to the high level for Tier 2* designation. This review included an evaluation of the performance requirements for the sump strainers described in, including testing performed in support of, Technical Report MUAP-08001-P, US-APWR Sump Strainer Performance.

Impact on DCD

Revision 4 of the DCD Tier 2 incorporated changes to Chapter 1, Appendix 1A, Table 1A-1 and Table 1.8-2, Sections 6.2.2.3.2, 6.2.2.3.3. 6.2.2.3.4 and 6.2.8, and Table 6.2.2-4. Additional changes are shown in the attached markup for DCD Tier 2, Chapter 1, Appendix 1A, Table 1A-1 and Sections 6.2.2.3.2 and, 6.2.2.3.3, and Table 6.2.2-4.

Impact on R-COLA

There is no impact on the R-COLA.

Impact on PRA

There is no impact on the PRA.

Impact on Technical / Topical Reports

There is no impact on the Technical / Topical Reports.

Table 1.8-2 Compilation of All Combined License Applicant Items for Chapters 1-19 (Sheet 15 of 38)

COL ITEM NO.	COL ITEM
COL 5.3(5)	*Preservice and Inservice Inspection; The COL Applicant provides the information for preservice and inservice inspection described in Subsection 5.2.4.*
COL 5.4(1)	*Deleted*
COL 5.4(2)	*Deleted*
COL 5.4(3)	*Deleted*
COL 5.4(4)	*Deleted*
COL 5.4(5)	*Deleted*
COL 5.4(6)	*Deleted*
COL 5.4(7)	*Deleted*
COL 6.1(1)	*Deleted*
COL 6.1(2)	*Deleted*
COL 6.1(3)	*Deleted*
COL 6.1(4)	*Deleted*
COL 6.1(5)	*Deleted*
COL 6.1(6)	*Deleted*
COL 6.1(7)	*The COL Applicant is responsible for identifying the implementation milestones for the coatings program.*
COL 6.2(1)	*Deleted*
COL 6.2(2)	*Deleted*
COL 6.2(3)	*Deleted*
COL 6.2(4)	*Deleted*
COL 6.2(5)	*Preparation of a cleanliness, housekeeping and foreign materials exclusion program is the responsibility of the COL Applicant. This program will be established to limit latent debris, and to limit the allocated miscellaneous debris per sump to the limits specified in Table 6.2.2-4.*
COL 6.2(6)	*Preparation of administrative procedures is the responsibility of the COL Applicant. The procedures will ensure that RMI and fiber insulation debris within ZOIs will be consistent with the design basis debris specified in Table 6.2.2-4, and will ensure that the aluminum in containment exposed to water in containment in post-LOCA condition (i.e., spray and blowdown water) is limited to equal or less than 810 ft^2.*
COL 6.2(7)	*Deleted*
COL 6.2(8)	*The COL Applicant is responsible for identifying the implementation milestone for the containment leakage rate testing program described under 10 CFR 50, Appendix J.*
COL 6.2(9)	*Deleted*
COL 6.2(10)	*Deleted*

Table 1A-1 Index of Tier 2* Information (Sheet 1 of 1)

Description	Expiration	Location
Cladding oxide thickness inspection and documentation	Successful completion of inspection and documentation for first plant.	4.2.4.5.3
~~Containment latent debris and miscellaneous debris design basis limits~~	None	6.2.2.3.2, 6.2.2.3.3, Table 6.2.2-4
Requirement to maintain the turbine missile generation probability, P_1, less than the acceptable limit of 1×10^{-5} per year	First full power operation	3.5.1.3.2 10.2.2.1

DCD_06.03-112 S01

Limits for fiber and particle components of the containment latent debris, the miscellaneous debris, and the operational margin fiber loading

- Anti-sweat Insulation forms a system comprised of pre-fabricated units (modules or panels) engineered as integrated assemblies to fit the insulated surface. This insulation is held in place with sealant or equivalent.

As discussed in Subsection 6.1.2, DBA-qualified epoxy coatings are applied in the containment in accordance with RG 1.54 (Ref. 6.2-41).

Programmatic controls will be established to ensure that potential sources of debris introduced into containment (e.g., insulation, coatings, foreign material, aluminum), and plant modifications, will not adversely impact the ECC/CS recirculation function. These programmatic controls will be established consistent with guidance provided in RG 1.82, Rev. 3 (Ref. 6.2-23), in order to ensure that potential quantities of post-accident debris are maintained within the bounds of the analyses and design bases that support Emergency Core Cooling (ECC) and Containment Spray (CS) recirculation functions and to ensure that the long term core cooling requirements of 10 CFR 50.46 are met. Table 6.2.2-2 presents a comparison of the RWSP sump strainer design to the guidance of RG 1.82. Also, refer to Subsection 6.2.2.3.12 and 6.2.2.3.13, "Downstream Effects – In-Vessel/Ex-Vessel."

The following is a summary of the programmatic controls that will be implemented to ensure that activities are conducted in a manner that ensures ECC/CS strainer operation, and limits the quantity of latent (unintended dirt, dust, paint chips, and fibers) and miscellaneous (tape, tags, stickers) debris inside containment:

Change this to "200 lbs", remove brackets, * and italics

- Preparation of a cleanliness, housekeeping and foreign materials exclusion program. This program addresses latent and miscellaneous debris inside containment (Ref. 6.2-40). An acceptance criterion below the conservative assumption of *[200 lbs]** for latent debris (unintended dirt, dust, paint chips, and fibers which principally consist of fiber and particulate debris) inside containment will be established consistent with MUAP-08001-P Sump Strainer Performance Evaluation (Ref. 6.2-34). The program will also ensure that the quantity of miscellaneous debris in containment will be limited such that the allocated *[200 ft^2]** strainer surface area per sump margin per MUAP-08001-P, will be met to ensure ECC/CS strainer operation. A cleanliness, housekeeping and foreign materials exclusion program will be established by the COL Applicant. DCD_06.03-112 S01

- Procedures will be implemented to ensure administrative controls are established for regulatory and quality requirements, for plant modifications and temporary changes, which include consideration of debris source term (i.e., RMI insulation, fiber insulation, inventory of: aluminum, latent debris and miscellaneous debris) introduced into the containment that could contribute to sump strainer blockage. The procedure will ensure that the quantity of RMI and fiber insulation within the ZOIs will be consistent with the design basis debris described in the Table 6.2.2-4, and will ensure that the aluminum in containment exposed to containment spray water is limited to equal or less than 810 ft^2. Included will be requirements for controlling temporary modifications to systems, structures and components (SSCs) in a manner which ensures compliance with 10 CFR 50.46. Future plant modifications will be evaluated in accordance with the requirements of 10 CFR 50.59 and 10 CFR 52.63.

- Maintenance activities, including associated temporary changes, will be subject to the provisions of 10 CFR 50.65(a)(4), which requires a licensee to assess and manage the increase in risk that may result from the proposed maintenance activities, prior to performing the activities. These activities may be shown to be acceptable with respect to the ECC/CS strainers by any of the following means:

    1. performing the maintenance activities when the ECC/CS strainers are not required to be operable and restoring conditions consistent with the design bases prior to re-establishing operability;

    2. conducting a deterministic evaluation that concludes the specific activities do not create a condition that adversely affects strainer performance;

    3. controlling the maintenance activities within the bounds established by approved programs that assure no adverse impact (e.g., activities do not result in exceeding limits established for temporary use of material inside containment), and;

    4. performing a risk assessment for a specific activity.

  Combined License Applicant Item COL 17.6(1) addresses development and implementation of the maintenance rule program in accordance with 10 CFR 50.65.

- A containment coating monitoring program will be implemented in accordance with the requirements of Regulatory Guide 1.54, Revision 2 (Ref. 6.2-41). The coatings program is described in Subsections 6.1.2 and 6.2.2.3.9.

Information in this subsection that is italicized and enclosed in square brackets with an asterisk following the closing bracket is a special category of information designated by the NRC as Tier 2. Any change to this information requires prior NRC approval.*

6.2.2.3.3 Debris Generation

The SE of NEI 04-07 guidance report (GR) (Ref. 6.2-24) and the NRC letters to NEI (Ref. 6.2-46 and 6.2-47) are used to determine the zone of influence (ZOI) for generating debris. The diameter of the ZOI for RMI debris generation is 2 inside diameters of the worst-case break line and 4 inside diameters for coating debris. For the sump performance evaluation, the design basis debris quantities are based on the following:

- For RMI insulation, all insulation on a cross-over leg (CO/L) is considered to generate debris.

- No design fiber insulation debris is generated within the ZOI. As an operational margin for future plant modification, fiber insulation debris is assumed and included in the strainer design.

Change this to "200 lbs", remove brackets, * and italics

- For coating debris, the generated debris volume is based on the surface area for the ZOI from the main coolant pipe break and a conservative coating thickness. As an operational margin for the plant, an additional amount of coating debris is assumed and included in the strainer design.

DCD_06.03-112 S01

For latent debris, *[200 lbs]** of fiber and particulate is applied, as recommended in the guidance (Ref. 6.2-24). Specific material types for miscellaneous debris, such as tapes, tags or stickers, reaching the strainer are not specified. Instead, a *[200 ft^2]** penalty of sacrificial strainer surface area per sump is considered as a margin for future detailed design and installation. These debris sources are controlled by the foreign material exclusion program that will be established by the plant owner.

The design basis debris for sump strainer performance is summarized in Table 6.2.2-4. More detailed information is provided in the Sump Strainer Performance Evaluation document (Ref. 6.2-34).

Information in this subsection that is italicized and enclosed in square brackets with an asterisk following the closing bracket is a special category of information designated by the NRC as Tier 2. Any change to this information requires prior NRC approval.*

6.2.2.3.4 Debris Characteristics

The US-APWR assumes that all fiber debris within the ZOI is "fines". The specification of debris characteristics used for the sump performance evaluation is determined based on the SE of NEI 04-07 (Ref. 6.2-24). The SE classified fibrous debris into four groups as follows:

1. fines that remain suspended,
2. small piece debris that are transported along the floor,
3. large piece debris with the insulation exposed to potential erosion, and
4. large debris with the insulation undamaged but still protected by a covering and thereby preventing erosion.

Fine fiber debris is considered suspended and transportable to the strainer. The post-LOCA 30-day erosion of small fiber debris into fines does not require consideration, because all fiber debris is already assumed to be fine.

RMI insulation debris is assumed to consist of 75 percent small fines and 25 percent large pieces, in accordance with the SE of NEI 04-07 (Ref. 6.2-24). The RMI debris is considered as "non-suspended" in the sump pool due to its specific gravity. For RMI debris characterization, the effect of erosion during the 30 days of post-LOCA operation is not required.

Coating debris within the ZOI is assumed to consist of 100 percent fines, in accordance with the SE of NEI 04-07 (Ref. 6.2-24). The effect of erosion is not considered for coating debris because coating debris is defined as fines.

The latent debris characteristics are based on the SE of NEI GR (Ref. 6.2-24). Latent fiber comprises 15 percent (by mass) of the total latent debris loading. The latent fiber is comparable to fiberglass "NUKON™" insulation and is considered to be fines, as discussed above. The remainder of the latent debris consists of particulate debris, such as latent dust and dirt. Size distribution for latent particulate debris is based on the guidance found in NUREG CR-6877 (Ref. 6.2-39). The effect of erosion is not required to be considered for latent debris.

6.2.2.3.5 Debris Transport

Debris transport is the estimation of the fraction of debris that is transported from debris sources (break location) to the sump strainer. The US-APWR assumes that all debris generated in the containment is transported to operable sumps. No debris entrapment in containment is credited in the debris transport evaluation.

The US-APWR has four ECC/CS trains with an independent strainer for each train. The design requires a minimum of two trains in operation, thereby assuming one train is out of service due to on-line maintenance and another one has a single failure. Therefore, transported debris in the sump pool is assumed to be distributed to two, three, or four sumps. The number of operable sumps during LOCA is a key parameter to determine the debris distribution to each sump. This logic establishes the conditions for subsequent evaluations.

For the strainer head loss evaluation, the number of available sumps should maximize the head loss, i.e., assume only two operable sumps. For the bypass debris, the number of operable sumps should maximize the amount of bypass debris, i.e., assume four operating sumps. A more detailed discussion is provided in the Sump Strainer Performance (Ref. 6.2-34).

6.2.2.3.6 Debris Head Loss

The design basis strainer head loss (i.e., 4.0 ft of water at 120° F) is established to evaluate available Net Positive Suction Head (NPSH) of ECC/CS pumps (See Subsection 6.2.2.3.7). The prototypical strainer head loss tests (Ref. 6.2-34) support the design basis strainer head loss with margin.

6.2.2.3.7 Net Positive Suction Head

From the Sump Strainer Performance (Ref. 6.2-34), available Net Positive Suction Head (NPSH) was calculated using the most limiting conditions applicable to all events. For the NPSH available calculation, the containment pressure is assumed equal to the initial containment pressure prior to the start of the accident for low temperatures (sump fluid temperatures below the saturation temperature corresponding to the initial containment pressure).

For temperatures higher than this initial saturation pressure, the containment pressure is conservatively assumed to be equal to the sump fluid vapor pressure. This assumption is independent from the calculated increases in containment accident pressure; instead, the assumed containment pressure is dependent on the RWSP fluid temperature itself. No containment pressure above the fluid saturation pressure is credited (i.e., the

6.2.7 Fracture Prevention of Containment Pressure Vessel

Ferritic containment pressure boundary materials include the ferritic portions of the containment vessel and all penetration assemblies or appurtenances attached to the containment vessel; all piping, pumps and valves attached to the containment vessel, or to penetration assemblies out to and including the pressure boundary materials of any valve required to isolate the system and provide a pressure boundary for the containment function.

Ferritic containment pressure boundary materials meet the fracture toughness criteria and requirements for testing identified in Article NE-2000 of Section III, Division 1 (Ref. 6.2-32) or Article CC-2000 of Section III, Division 2 of the ASME Code (Ref. 6.2-33).

6.2.8 Combined License Information

Any utility that references the US-APWR design for construction and Licensed operation is responsible for the following COL items:

COL 6.2(1) *Deleted*

COL 6.2(2) *Deleted*

COL 6.2(3) *Deleted*

COL 6.2(4) *Deleted*

COL 6.2(5) *Preparation of a cleanliness, housekeeping and foreign materials exclusion program is the responsibility of the COL Applicant. This program will be established to limit latent debris, and to limit the allocated miscellaneous debris per sump to the limits specified in Table 6.2.2-4.*

COL 6.2(6) *Preparation of administrative procedures is the responsibility of the COL Applicant. The procedures will ensure that RMI and fiber insulation debris within ZOIs will be consistent with the design basis debris specified in the Table 6.2.2-4, and will ensure that the aluminum in containment exposed to water in containment in post-LOCA condition (i.e., spray and blowdown water) is limited to equal or less than 810ft^2.*

COL 6.2(7) *Deleted*

COL 6.2(8) *The COL Applicant is responsible for identifying the implementation milestone for the containment leakage rate testing program described under 10 CFR 50, Appendix J.*

COL 6.2(9) *Deleted*

COL 6.2(10) *Deleted*

Make this italic

Change this to "200 lbs", remove brackets, * and italics

Make this italic

[1.875 (ft^3)]*

[30 (lbm)]*

[170 (lbm)]*

Make this italic

DCD_06.03 -112 S01

Table 6.2.2-4 Design Basis Debris

Type		Amount
RMI (Transco)		106 (ft^3)
Fibrous Insulation (NUKON™)		0.0 (ft^3) (1)
Coating (Epoxy)		3.0 (ft^3) (2)
Latent Debris *[(200 lbm)]**	Fiber (15%)	~~30 (lbm)~~
	Particle (85%)	~~170 (lbm)~~
Miscellaneous Debris		*[200 ft^2 strainer surface area per sump]**
Chemical debris	Aluminum Hydroxide	300 (lbm)
	Sodium Aluminum Silicate	330 (lbm)

Note: The following debris is included as operational margin, in addition to the amounts above:
(1) ~~1.875 (ft^3)~~ of fiber debris
(2) 200 (lbs) of coating debris

Information in this table that is italicized and enclosed in square brackets with an asterisk following the closing bracket is a special category of information designated by the NRC as Tier 2. Any change to this information requires prior NRC approval.*