

# AP1000 DOCUMENT COVER SHEET

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\* Approval of the responsible manager signifies that document is complete, all required reviews are complete, electronic file is attached and document is released for use.

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**APP-GW-GLR-008**  
**Revision 0**

**March 2006**

# **AP1000 Standard Combined License Technical Report**

## **Request for Closure of COL Items in DCD Chapter 11 Identification of Adsorbent Media**

**Revision 0**

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## AP1000 Standard Combined License Application Technical Report Request for Closure of COL Items in DCD Chapter 11 Identification of Adsorbent Media

### Introduction

Revision 15 of the AP1000 Design Control Document (DCD) (Reference 1) includes two items relating to adsorbent media which are identified as the responsibility of the Combined Construction and Operating License (COL) applicant:

- COL Information Item 11.2-3: The COL applicant will identify the types of liquid waste ion exchange and adsorbent media to be used in the liquid radwaste system (WLS). This is FSER (Reference 2) Action Item 11.2-3).
- COL Information Item 11.3-2: The COL applicant will identify the types of adsorbent media to be used in the gaseous radwaste system. This is FSER (Reference 2) Action Item 11.3-2).

For both of these applications, this media is considered to be a consumable item, designed for replacement when expended. The media will be replaced multiple times throughout the operating life of the plant.

Furthermore, there is ongoing development of this replaceable media by various vendors. That ongoing technical development, coupled with differing evolutions in plant chemistry, means that selection of a specific media for the life of the plant is both impractical and undesirable. Therefore, media selection should be a matter for the plant operator, and should not be identified at the COL application stage.

### Technical Background

The DCD provides results of analyses using conservative assumptions regarding the performance of this media as follows:

- DCD Table 11.2-5 provides assumed decontamination factors for the resins and other disposable media used in the liquid radwaste system based upon NUREG-0017 and published experience. These factors are conservatively low, representing the point at which the media would typically be taken out of service.
- DCD Table 11.3-1 provides assumed holdup times for the activated charcoal used in the gaseous radwaste system. Again, these values are conservatively low; credit is taken for 50% of the available charcoal volume (one of two delay beds), although both beds will continually be in service.

In both cases, analyses reported in the DCD demonstrate that overall system performance is adequate to meet regulatory requirements with these conservatively selected performance assumptions.

The selection of ion exchange media used in the liquid radwaste system may be adjusted by the plant operator many times throughout plant life, as discussed in DCD section 11.2.2.1.1.

The performance of the liquid radwaste system has been conservatively demonstrated to be adequate with the decontamination factors provided in Table 11.2-5, using general purpose ion exchange media. The plant operator might select alternative media to give performance which is superior to this general

purpose media. This selection will be made periodically throughout the life of the plant, and will be influenced by prevailing plant conditions and the then current ion exchange media technology.

In the case of the gaseous radwaste system, standard activated charcoal is specified for the DCD description and analysis. A change from activated charcoal would only be made if some new media with superior performance becomes available.

In all cases, it is the responsibility of the plant operator to ensure releases meet the requirements of 10 CFR Part 50, Appendix I and the concentration limits of 10 CFR 20. The selection of ion exchange media is only one part of the overall discharge strategy.

Requiring the Combined License Applicant to more specifically identify ion exchange or gas delay bed media during the Combined Licensing phase does not provide useful additional information.

### **Regulatory Impact**

The FSER discusses the selection of ion exchange media in Subsection 11.2.1. Decontamination factors and waste generation rates are based on a general purpose ion exchange media. The use of a general purpose ion exchange media will have no impact on the FSER discussion of the handling and treatment of radioactive wastes. The FSER conclusions in 11.2.2 are not impacted by use of a general purpose ion exchange media.

The FSER discusses the use of activated carbon in the waste gas system in Subsection 11.3.1. Adsorption of fission gasses is assumed to be by the activated carbon. The use of adsorption by the activated carbon will have no impact on the FSER discussion of holdup, decay and release of radioactive gaseous wastes. The FSER conclusions in 11.3.2 are not impacted by use of adsorption by activated carbon.

The changes to the DCD presented in this report do not represent an adverse change to the design function or to how design functions are performed or controlled. The changes to the DCD do not involve revising or replacing a DCD-described evaluation methodology nor involve a test or experiment not described in the DCD. The DCD change does not require a license amendment per the criteria of VIII. B. 5.b. of Appendix D to 10 CFR Part 52.

The DCD change does not affect resolution of a severe accident issue and does not require a license amendment based on the criteria of VIII. B. 5.c of Appendix D to 10 CFR Part 52.

The closure of the COL Information Item will not alter barriers or alarms that control access to protected areas of the plant. The closure of the COL Information Item will not alter requirements for security personnel. Therefore, the closure of the COL Information Item does not have an adverse impact on the security assessment of the AP1000.

### **REFERENCES**

1. APP-GW-GL-700, AP1000 Design Control Document, Revision 15
2. NUREG-1793, Final Safety Evaluation Report Related to Certification of the AP1000 Standard Design, September 2004.

## DCD Mark-Up

The following DCD markups identify how COL application FSARs should be prepared to incorporate the subject change.

Revise the first paragraph of 11.2.2.3.4 as follows:

### 11.2.2.3.4 Liquid Radwaste System Ion Exchangers

Four ion exchange vessels are provided, with resin volumes as shown in Table 11.2-2. The media will be selected by the ~~Combined License holder plant operator~~ to optimize system performance. They ~~ion exchange vessels~~ are stainless steel, vertical, cylindrical pressure vessels with inlet and outlet process nozzles plus connections for resin addition, sluicing, and draining. The process outlet and flush water outlet connections are equipped with resin retention screens designed to minimize pressure drop.

Revise 11.2.5.3 as follows:

### 11.2.5.3 Identification of Ion Exchange and Adsorbent Media

~~Completed. The Combined License applicant will identify the types of~~ **The discussion of the liquid waste system and component design and operation in Subsection 11.2.2 is based on the use of a general purpose ion exchange and adsorbent media to be used in the liquid radwaste system (WLS). This determination will be based on developments in ion-exchange technology and specific characteristics of the liquid radwaste to be processed.**

Revise 11.3.5.2 as follows:

### 11.3.5.2 Identification of Adsorbent Media

~~Completed. The Combined License applicant will identify the types of adsorbent media to be used in the gaseous radwaste system is identified in 11.3.2.1.~~