QUESTION 281.1

Establish and state appropriate limits for the conductivity of the purified condensate to the reactor vessel in accordance with Regulatory Position C.1 of Regulatory Guide 1.56, Revision 1.

Also, describe the sampling frequency, chemical analyses, and established limits for dissolved and suspended solids that will be performed and the basis for these limits.

RESPONSE:

General Electric specifies .1 micro MHO/cm @ 25°C for purified condensate conductivity to the reactor vessel. Additional limits and actions are listed in the Technical Specifications.

A design modification is undergoing engineering review to permit on line sampling. It is anticipated that suspended solids (defined as collectable on a 0.45 micron-pure-size-rated membrane filter paper) will be collected on an on-line filter paper which normally accumulates for a period of 1 to 7 days (7 day samples will check flow rate once per day). All filters collected during a 7 day period of normal sampling will be combined to determine an average weekly ppb. Total metal will be tested for one or more of the following: Fe, Cu, Ni, Cr.

Dissolved solids will be sampled once per week. Either a grab sample or caution exchange technique will be used to obtain a sample capable of detecting 2 ppb Cu and 5 ppb Fe.

Additionally, once per month a 24 hour composite sample will be collected on either cation exchange papers or cation exchange columns (after a change of 0.45 micron filter paper). The copper, nickel, chromium and iron concentrations will be determined from this composite sample.

Expected limits (ppb) for operations above 50% power are as follows:

Parameter	Normal	Max.	Time allowed above normal
Total suspended	≤15.0	≤50.0	14 days/12 mo. period
Suspended Fe	≤15.0	NA	NA
Suspended Cu	≤2.0	≤2.0	NA
Total dissolved	≤15.0	≤50.00	14 days/12 mo. period
Dissolved Fe	≤15.0	NA	NA
Dissolved Cu	≤2.0	NA	NA
Total metals	≤30.0	≤100	14 days/12 mo. period
Total Fe	≤30.0	NA	NA
Total Cu	≤2.0	NA	NA

The basis for these limits are the prevention of crud build-up on fuel heat transfer surfaces and the minimization of transport of active corrosion products outside of the core as established by GE fuel warranties.

QUESTION 281.2

Establish and state sequential regeneration frequency in order to maintain adequate capacity margin in the condensate treatment system (Regulatory Position C.2 of Regulatory Guide 1.56, Revision 1). Include the basis for the resin regeneration frequency.

RESPONSE:

See revised Subsection 10.4.6.2.1.

QUESTION 281.3

Indicate that the initial total capacity of new demineralizer resins will be measured and describe the method to be used for this measurement (Regulatory Position C.3 of Regulatory Guide 1.56, Revision 1).

RESPONSE:

A representative sample of each batch of new resin will be taken and either sent to the manufacturer of the resin, sent to a laboratory that specializes in resin testing, or tested by PP&L. The methods used will be either those suggested by the resin manufacturer of by ASTM for total exchange capacity.

QUESTION 281.4

Describe the method of determining the condition of the demineralizer units so that the ion exchange resin can be regenerated or replaced before an unacceptable level of depletion is reached (Regulatory Position C.4 of Regulatory Guide 1.56, Revision 1). Describe the method by which (a) the conductivity meter readings for the condensate cleanup system will be calibrated, (b) the flow rates through each demineralizer will be measured, (c) the quantity of the principal ions likely to cause demineralizer breakthrough will be calculated, and (d) the accuracy of the calculation of resign capacity will be checked.

RESPONSE:

See response to Question 281.2. The following additional response is given for 281.4.

a) The conductivity cell will be checked with an in-line laboratory cell once per week.

b) Flow rates are measured by means of an annubar on the inlet to each demineralizer vessel and recorded at the local control panel.

c) and d) The system has been designed for conductivity endpoint as an indication of demineralizer breakthrough rather than by calculation as described in regulatory position 4.c of Regulatory Guide 1.56.

QUESTION 281.5

Indicate the control room alarm set points of the conductivity meters at the inlet and outlet demineralizers in the condensate and reactor water cleanup systems when either (Regulatory Position C.5 of Regulatory Guide 1.56, Revision 1):

a) The conductivity indicates marginal performance of the demineralizer systems.

b) The conductivity indicates noticeable breakthrough of one or more demineralizers.

RESPONSE:

Reactor water cleanup system controls room alarm set points of the conductivity meters at the demineralizer inlet and outlet are ≤1 micro MHO/cm and ≤.1 micro MHO/cm respectively (Modes 1, 2, and 3). Additional appropriate limits and actions are listed in SSES Technical Specifications Section 3.4.4.4. These set points accomplish a. and b. of the question and are consistent with Regulatory Position C.5 of Regulatory Guide 1.56, Revision 1.

See response to 281.2.

QUESTION 281.6

The reactor coolant limits and corrective action to be taken if the conductivity, pH, or chloride content is exceeded will be established in the Technical Specifications. Describe the chemical analysis methods to be used for their determination (Regulatory Position C.6 of Regulatory Guide 1.56, revision 1).

RESPONSE:

The conductivity of the reactor coolant is continuously monitored by an in-line plant instrument. The in-line instrument will be verified to be reading correctly once per week by a flow through lab cell.

The ph of the reactor coolant will be analyzed by using a grab sample when the conductivity exceeds one micro-mho. The electrode method will be used.

The chloride content will be determined from a grab sample by one of several approved plant procedures depending on the chloride concentration level.

QUESTION 281.7

Describe the water chemistry control program to assure maintenance of condensate demineralize influent and effluent conductivity within the limits of Table 2 of Regulatory Guide 1.56, Revision 1. Include conductivity meter alarm set points and the corrective action to be taken if the limits of Table 2 are exceeded.

RESPONSE:

See revised Subsection 10.4.6.3.

QUESTION 281.8

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QUESTION 281.9

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QUESTION 281.10

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