File: Stand by Press Control System

Vollmer (NRC)

Inter-Office Memorandum

Date: July 31, 1979
TSG-322

GPU Service

Subject: Task 6B - Reactor Coolant Pressure Control System - Makeup Portion Design Makeup Rate to the RCS

To: R. C. Arnold

Location: TMI

Since the issuance of the original design criteria for Task 6B - Reactor Coolant Pressure Control System (RCPCS) - Makeup Portion in April 1979, the Reactor Coolant System (RCS) operating conditions have changed substantially. Following is a table comparing the operating conditions in April 1979 and now:

		April	July
1.	Reactor Decay Heat, MW	~4	~1
2.	RCS Cooling Mode	Forced Circulation	Natural Circulation
3.	RCS Pressure, psig	~1000	~275
4.	RCS Temperature, °F	~250	~170

Therefore, the maximum makeup rate required to the RCS has to be reevaluated based on the present and future possible operating conditions.

The original RCS makeup rate was calculated based on the following assumptions: (a) Once-through steam generator (OTSG) "B" cooldown scheme is used, (b) RCS is in natural or forced circulation, (c) Pressurizer is full, (d) OTSG secondary side is in solid water condition, (e) OTSG secondary side cooling water is lost, and (f) RCS temperature increases by 50° F before the operator lets in cooling water to the OTSG secondary side at a flow rate of 5000 gpm and a temperature of 50° F. The makeup rate required is 500 gpm.

The revised RCS makeup rate is determined by considering transient condition for two cooldown schemes. One is OTSG "A" cooldown scheme and has the following assumptions: (a) Pressurizer is full, (b) OTSG secondary side is in steaming condition, (c) RCS is initially in natural circulation and then natural circulation is lost such that OTSG primary side water is stagnant and no heat is removed from the reactor, and (d) RCS temperature increases by 50° F and OTSG secondary side boils dry before the operator opens start-up feedwater control valve fully to let in feedwater at a flow rate of 3000 gpm and a temperature of 50° F. The makeup rate required is 100 gpm. The other is OTSG "B" cooldown scheme and has the same assumptions as those for OTSG "A" cooldown scheme except that (a) OTSG secondary side is in solid

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water condition and (b) Feedwater flow rate is 5000 gpm. The makeup rate required is 150 gpm which is the more stringent requirement, and therefore, will be used as the revised design criteria.

The design criteria of Task 6B - RCPCS - Makeup Portion will be revised shortly to reflect the above changes.

T. Lu

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Approved : B. D. Elam

B. D. Elam

TL/jb

cc: R. F. Wilson
J. G. Herbein
D. K. Croneberger
J. R. Floyd
J. P. Moore
E. C. Dye
T. Hawkins
M. J. Konya
R. H. Vollmer (NRC)
G. E. Kulynych (B&W)
H. R. Lane (B&R)