

TITLE System Isolation for MELB Flooding				PLANT/UNIT Watts Bar 1 & 2	
PREPARING ORGANIZATION Sargent & Lundy		KEY NOUNS (Consult RIMS DESCRIPTORS LIST) Pipe Rupture, Flooding, SHUTDOWN, NUC SAFETY SYSTEMS			
BRANCH/PROJECT IDENTIFIERS WBN-OSG4-100		Each time these calculations are issued, preparers must ensure that the original (RO) RIMS accession number is filled in.			
		Rev (for RIMS' use) 147		RIMS accession number	
RO		880513B0010 B26 '88 0504 020			
APPLICABLE DESIGN DOCUMENT(S) WB-DC-40-31.51		R _			
		R _			
SAR SECTION(S) N/A	UNID SYSTEM(S) N/A	R _			
Revision 0		R1	R2	R3	Safety-related? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
ECN No. (or indicate Not Applicable) N/A					Statement of Problem The purpose of this analysis is to document the actions and time required to isolate MELB Flooding sources including the actions required to establish required alternate trains.
Prepared <i>[Signature]</i>					
Checked <i>Thomas J. Kane</i>					
Reviewed <i>Russ W. Johnson</i>					
Approved <i>Robert D. [Signature]</i>					
Date 5/2/88					
Use form T-10534 if more space required.	List all pages added by this revision.				
	List all pages deleted by this revision.				
	List all pages changed by this revision.				
Abstract					
These calculations contain an unverified assumption(s) that must be verified later. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>					
<p>Analysis and review performed for this report has determined isolation methods for various systems at the Watts Bar Plant. This information is intended for use in evaluation of the effects of flooding on safe shutdown capability following postulated moderate energy line breaks (MELB) in fluid systems inside and outside containment (i.e. Auxiliary Building, Reactor Building, Control Building, Diesel-Generator Building, and ERCW Pumping Station).</p> <p>The isolation times assumed for various systems and supported by telephone conversation memoranda which constitute the unverified assumptions listed on page 7 of the text.</p> <p>Note: The attached calculation is Sargent & Lundy Calculation 3C38-0387-001, Revision 2, entitled "System Isolation for MELB Flooding".</p>					
9207070063 920630 PDR ADDCK 05000390 A PDR					
<input type="checkbox"/> Microfilm and store calculations in RIMS Service Center. <input checked="" type="checkbox"/> Microfilm and return calculations to: LINDA PATTON				Microfilm and destroy. <input type="checkbox"/> Address: CM7 IOB WBNP	

Calc. No. 3C38-0387-001
Revision: 1
Page 8
Project No: 7797-00

2.0 Summary

This analysis postulates a number of moderate energy break locations in various safety-related systems. It then defines an isolation activity which can generally be accomplished in 5 to 10 minutes assuming no active failure. Where possible, a second isolation activity is presented which provides alternative components which can accomplish the same isolation. The second isolation activity is provided as an alternative to listing many cases each with a single active failure.

Some postulated breaks are non-isolatable. Where possible, actions were determined which would minimize the consequences of these non-isolatable breaks. As a result, all non-isolatable moderate energy line breaks can be reduced to an elevation drive run out flow from: (1) a mechanical tank (2) the spent fuel pool, refueling cavity, fuel transfer tube and fuel transfer channel, or (3) a mechanical large reservoir.

The "results and conclusions" section of this analysis summarizes the non-isolatable moderate energy line breaks on a system by system basis.

Calc. No. 3C38-0387-001
Revision: 1
Page 9
Project No: 7797-00

3.0 Introduction

Analysis and review performed for this report has determined isolation methods for various systems at the Watts Bar Plant. This information is intended for use in evaluation of the effects of flooding on safe shutdown capability following postulated moderate energy line breaks (MELB) in fluid systems inside and outside containment, (i.e. Auxiliary Building, Reactor Building, Diesel Generator and Additional Diesel Generator Buildings, and ERCW pumphouse.)

The purpose of this calculation is to provide a supporting basis for the one hour detection and isolation time assumed in the flooding calculation (Reference 10). Certain lines found to be non-isolatable are discussed in Section 6.0. The effect of breaks in these lines is evaluated in Appendix I of Reference 10. Some zones evaluated in Reference 10 require detection and isolation in less than one hour, these are justified on a case by case basis in Reference 10. The isolation methods evaluated utilize a minimum number of valves to isolate various system MELB's and provide a reasonable time estimate for accomplishing the isolation.

Valves capable of being actuated from the control room are used whenever possible. The isolation methods examined herein are not the only method of isolating many of the breaks nor have they been evaluated from an operations point of view. Therefore, the methods examined should not be implemented as operating procedures without a thorough operation review of the actions prescribed.

The majority of the methods evaluated show isolation times of ten minutes or less. This is consistent with the assumption of a one hour detection and isolation time.

Breaks in the Auxiliary Building in either Essential Raw Cooling Water Discharge Header could require 30-45 minutes to isolate. The abnormally long isolation time is necessary to account for the potential cross tying of different cooling trains downstream of the

Calc. No. 3C38-0387-001

Revision: 2

Page 10

Project No. 7797-00

Component Cooling System Heat Exchangers. A break in either ERCW Discharge Header would occur in a heavily traveled area of the Auxilliary Building where one would expect a break of this possible magnitude to be detected in a very short period of time. Subsequent to the break, flood levels will rise to steady state levels as the water flows to emergency sump. These levels are expected to be established in five to ten minutes and persist at these steady state levels until the break is isolated. Filling the emergency sump requires several hours, therefore, if the one hour assumption for detection and isolation is valid, filling the sump is not a concern. For this case, 15-30 minutes for detection is believed more than adequate time so that detection and isolation can be realistically accomplished within 1 hour after the break.

The cases where isolation is not achievable have been identified to TVA and either break exclusion will be documented for these systems or the safe shutdown evaluation will demonstrate that safe shutdown can be achieved without isolation of these systems.