Enclosure 5
Plant Heat Sinks
(REDACTED)

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Plant Heat Sinks

March 25, 2014

(Redacted Version)

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This is a pre-application document and includes preliminary B&W mPower reactor design or design supporting information and is subject to further internal review, revision, or verification.

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Agenda

- Objectives
- Reactor Systems Overview
- Heat Sink Overview
  - System & Applicable DCD Sections
  - Heat Sink Process Flows
  - Physical Orientation of Heat Sinks
- Heat Sink Modes of Operation
  - Normal Operation & Shutdown
  - Loss of Feedwater
  - Loss of Off-Site Power & Station Blackout
  - Design Basis Accident
- Summary and Review

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Objectives

- Provide an overview of water plant heat sink with identification of reactor systems they support
- Identify where each water system will be addressed in the DCA (DSRS references)

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Reactor Systems Overview

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mPower System & DCD Sections

- Reactor Cooling System (RCS) – 5.4
- Auxiliary Condenser (CNX) – 5.4.14
- Passive Containment Cooling Tank (PCCT) – 6.2.2
- Emergency Core Cooling (ECC) – 6.3
- Component Cooling Water (CCW) – 9.2.2
- CIR Air Cooled Heat Exchanger (ACHE) – 9.2.5
- Chilled Water (CHW) – 9.2.7
- Reactor Coolant Inventory (RCI) – 9.3.6
- Heating Ventilation & Cooling (HVAC) – 9.4
- Steam (STM) – 10.3
- Main Condenser (CND) – 10.4.1
- Circulating Water (CIR) Cooling Tower – 10.4.5
- Feedwater (FW) – 10.4.7

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RCI System Configuration

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RCI Purification Function

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RCI RHR Function

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RCI High Pressure Decay Heat Removal

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CNX In Operation

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Containment Heat Removal

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Heat Sink Overview

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Heat Sink Process Flows

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Heat Sink Locations – Site Plot Plan

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Heat Sink Locations – NI Roof Plan

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Plant Heat Sinks

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Connection

= Piped

= Other

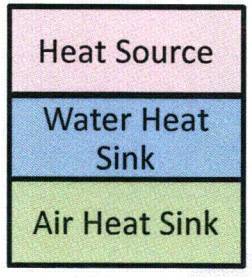
Power Supply

O = Offsite/Aux

D = Diesel

B = Battery

N = None



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Heat Sink Modes of Operation

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Normal Operation

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Connection

= Piped

= Other

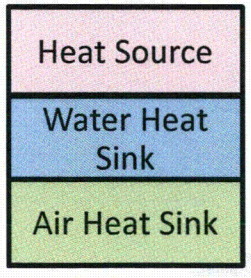
Power Supply

O = Offsite/Aux

D = Diesel

B = Battery

N = None



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Normal Shutdown – Short Term

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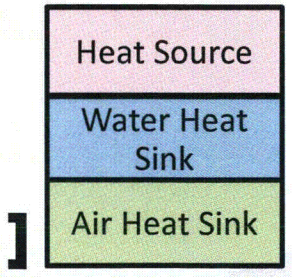
Connection

= Piped

= Other

Power Supply

O = Offsite/Aux
D = Diesel
B = Battery
N = None



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Normal Shutdown – Long Term

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Connection

= Piped

= Other

Power Supply

O = Offsite/Aux

D = Diesel

B = Battery

N = None

Heat Source

Water Heat Sink

Air Heat Sink

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Loss of Feedwater*

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Connection

= Piped

= Other

Power Supply

O = Offsite/Aux

D = Diesel

B = Battery

N = None

Heat Source

Water Heat Sink

Air Heat Sink

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Loss of Offsite Power

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= Piped

= Other

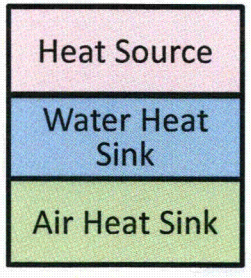
Power Supply

O = Offsite/Aux

D = Diesel

B = Battery

N = None



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Station Blackout (SBO)

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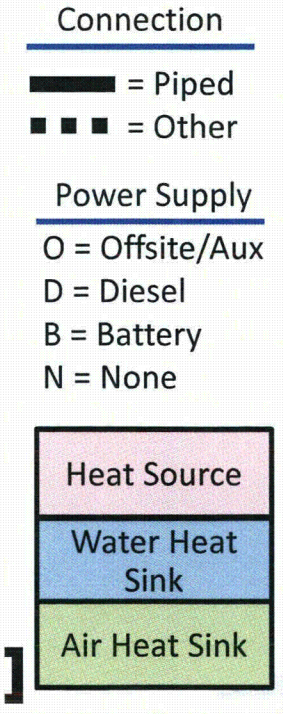

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Decay Heat Removal Following a DBA

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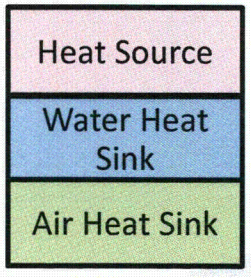
Connection

= Piped

= Other

Power Supply

O = Offsite/Aux
D = Diesel
B = Battery
N = None



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Summary

- Water Cooled Heat Sinks
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- Air Cooled Heat Sinks
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Questions

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