NRC FORM 658
(9-1999)

U.S. NUCLEAR REGULATORY COMMISSION

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Do not include proprietary materials.

DATE OF MEETING

12/16/2003

The attached document(s), which was/were handed out in this meeting, is/are to be placed in the public domain as soon as possible. The minutes of the meeting will be issued in the near future. Following are administrative details regarding this meeting:

Docket Number(s)	50-269, 50-270, AND 50-287
Plant/Facility Name	OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3
TAC Number(s) (if available)	MB6144, MB6145, AND MB6146
Reference Meeting Notice	DECEMBER 1, 2003 (ML033350007)
Purpose of Meeting (copy from meeting notice)	TO DISCUSS AMENDMENT TO TEMPORARILY EXTEND COMPLETION TIME OF KEOWEE HYDRO UNITS

NAME OF PERSON WHO ISSUED MEETING NOTICE	TITLE
L. N. OLSHAN	PROJECT MANAGER

OFFICE
NRR

DIVISION
DLPM

BRANCH
PD II-1

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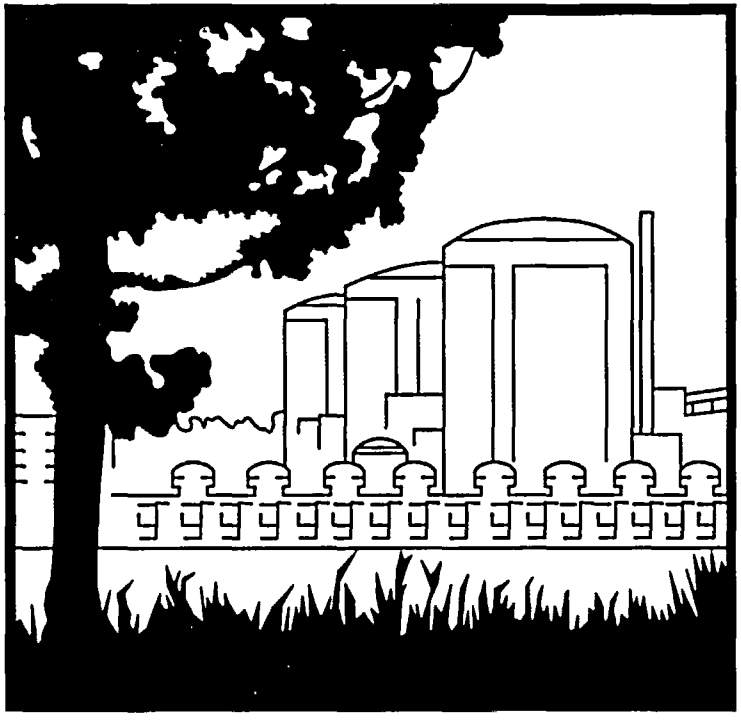

IMPROVING KEOWEE RELIABILITY

Oconee Nuclear Station

December 16, 2003

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Agenda

- Introductions
- Scope of Work Planned for Keowee
- Feasibility of Installing Temporary Diesels
- Overview of Risk Impact
- Wrap-up
- Closing Remarks

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SCOPE OF WORK PLANNED FOR KEOWEE

- Scope of Upgrades and Maintenance Work
- Integrated Schedule
- Need for Dual KHU Outage
- Reason For Dual KHU Outage AOT Extension Request
- Risk Reduction Measures
- Prep Work for Keowee Outages

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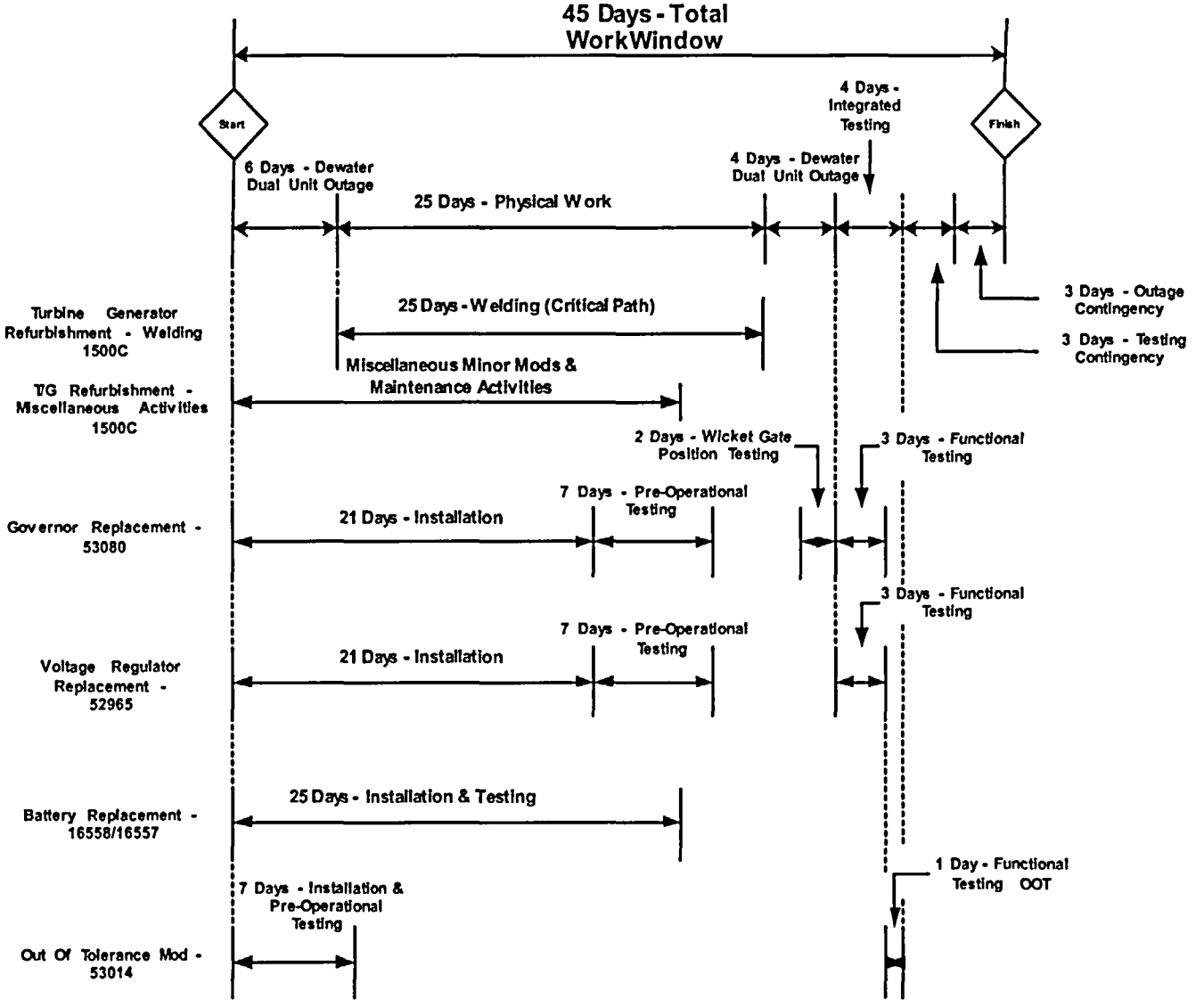
SCOPE OF UPGRADES AND MAINTENANCE WORK

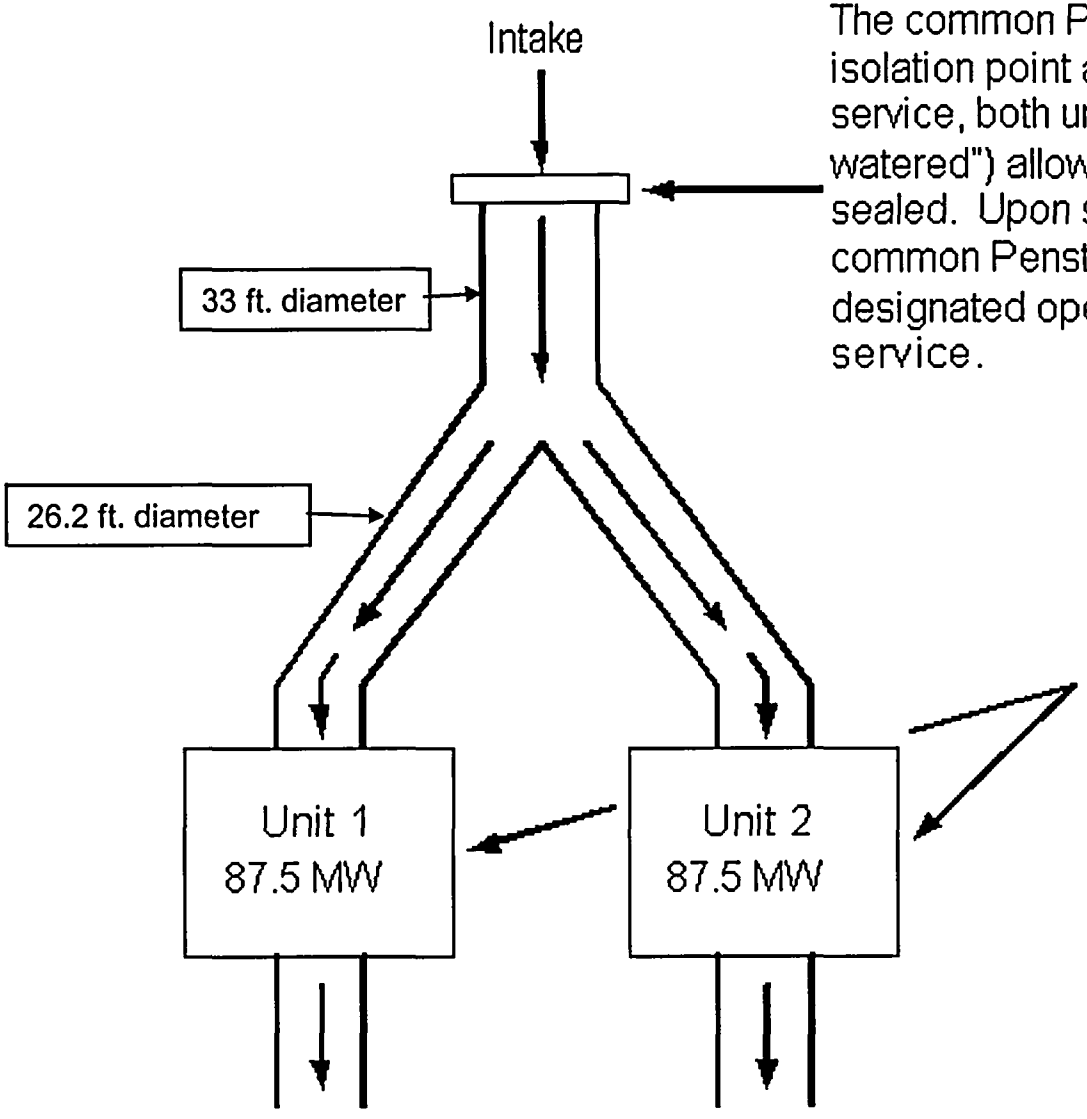
- Turbine Refurbishment
- Governor Replacement
- Voltage Regulator Replacement
- Battery Replacement
- Voltage and Frequency Out of Tolerance Modification
- Other Maintenance and Modifications

INTEGRATED SCHEDULE

Keowee Unit Outage



COMMON PENSTOCK (INTAKE)



The common Penstock provides the single physical isolation point at Keowee. To remove one unit from service, both units must be removed from service (i.e. "de-watered") allowing the unit designated for repair to be sealed. Upon sealing the unit designated for repair, the common Penstock is then "re-watered" allowing the designated operating unit to be returned back into service.

Each unit is individually sealed at its wicket gates (internal to the machine) prior to repair.

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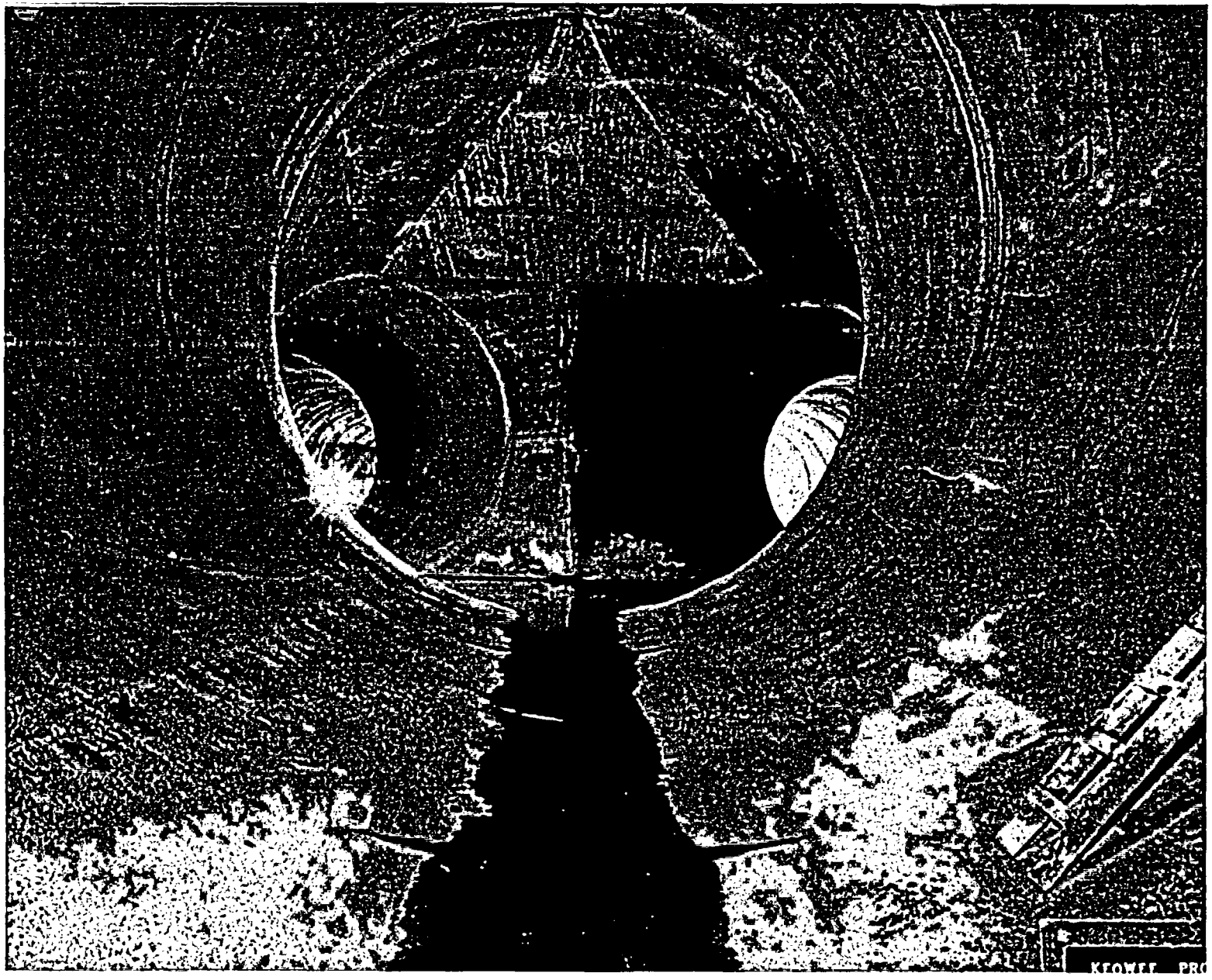
COMMON PENSTOCK (INTAKE)



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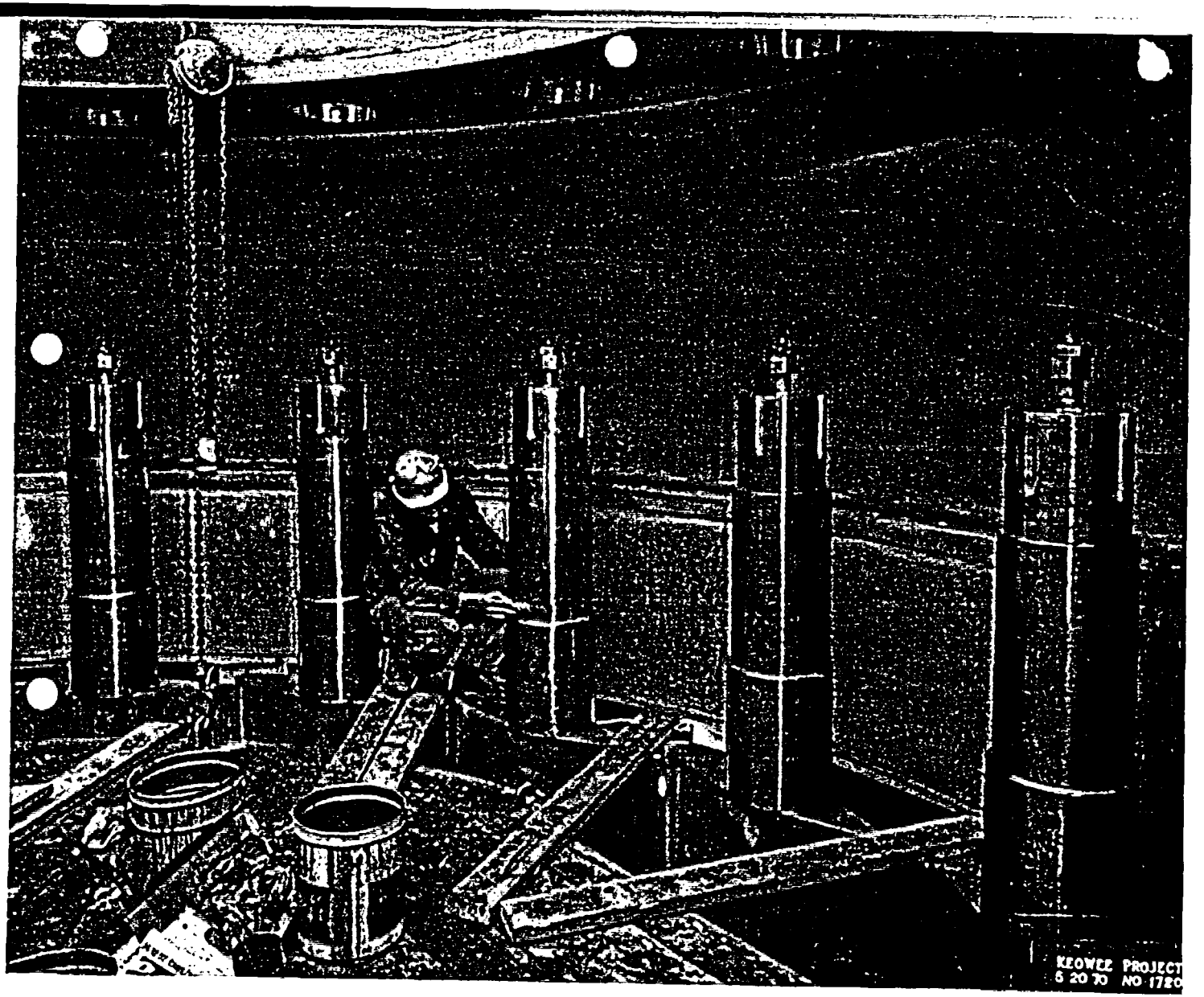
WICKET GATES



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NEED FOR DUAL KHU OUTAGE

- Dewatering needed to allow extensive refurbishment of the turbine blades and discharge ring

- KHUs share common intake (penstock)

  - Need to isolate KHU to be refurbished and return remaining KHU to service

  - Technical Specification 3.8.1.H currently allows 60 hours to restore one KHU when both are inoperable for planned maintenance activity

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REASON FOR DUAL KHU OUTAGE AOT EXTENSION REQUEST

- 1st dual KHU outage – est. duration of 84 hrs
- 2nd dual KHU outage – est. duration of 96 hrs
- Contingency of 60 hrs
- Current TS allows 60 hrs (or 120 hrs over 2 outages)
- Temporary TS change requests 120 cumulative hrs over what TS's would allow during the 2 dual KHU outages

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RISK INFORMED JUSTIFICATION

- 3.45E-06 Cumulative CDP for total maintenance evolution

- Risk reduction measures to offset risk

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RISK REDUCTION MEASURES CONSIDERED IN THE LAR

- LCT energizing both standby buses prior to and for duration of the outage
- LCOs for AC/DC Power Systems and Electrical Power Switching Logic (EPSL) must be met prior to start of the outage
- Operability of required offsite circuits will be maintained at all times
- No discretionary maintenance or testing on SSF, EFW, Switchyard, or essential AC power system during outage
- Outage performed during periods when the expected frequency of LOOP events as a result of severe weather is low (excludes March, April, May, and June)
- Reduced RCS Inventory not permitted during dual KHU outage

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ADDITIONAL RISK REDUCTION MEASURES PLANNED

- Manning SSF during dual KHU outage
- Two hour operability run of SSF DG prior to start of KHU outage
- Jocasse Hydro Unit capable of being separated and dedicated as an ONS source of power
- 2nd Lee Combustion Turbine running and available
- Additional Security for LCTs, Jocassee, and associated transmission lines during dual KHU outages

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PREP WORK FOR KEOWEE OUTAGE

- Offsite power reliability review
- Safety Review Group Assessment of Operations Communication
- Contingency plan to quickly stop/re-water to restore one KHU
- Wicket gate sealing mock up practice

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FEASIBILITY OF INSTALLING TEMPORARY DIESELS

- Overview of ONS Power System
- Process used to explore potential backup power supplies
- Options considered

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OVERVIEW OF ONS POWER SYSTEM

- Oconee Generator through the Normal Auxiliary Transformer
- 230 kV Switchyard through the Startup Transformer
- One Keowee Unit is aligned through the Overhead Path and Startup Transformer
- One Keowee Unit is aligned through the Underground Path and Transformer CT4
- The dedicated 100 kV Path from a Lee Combustion Turbine
- Central Switchyard through Transformer CT5
- Oconee Unit Startup Transformers can be shared between the Oconee Units (4160V and 6900V)
- Jocassee Hydro Station

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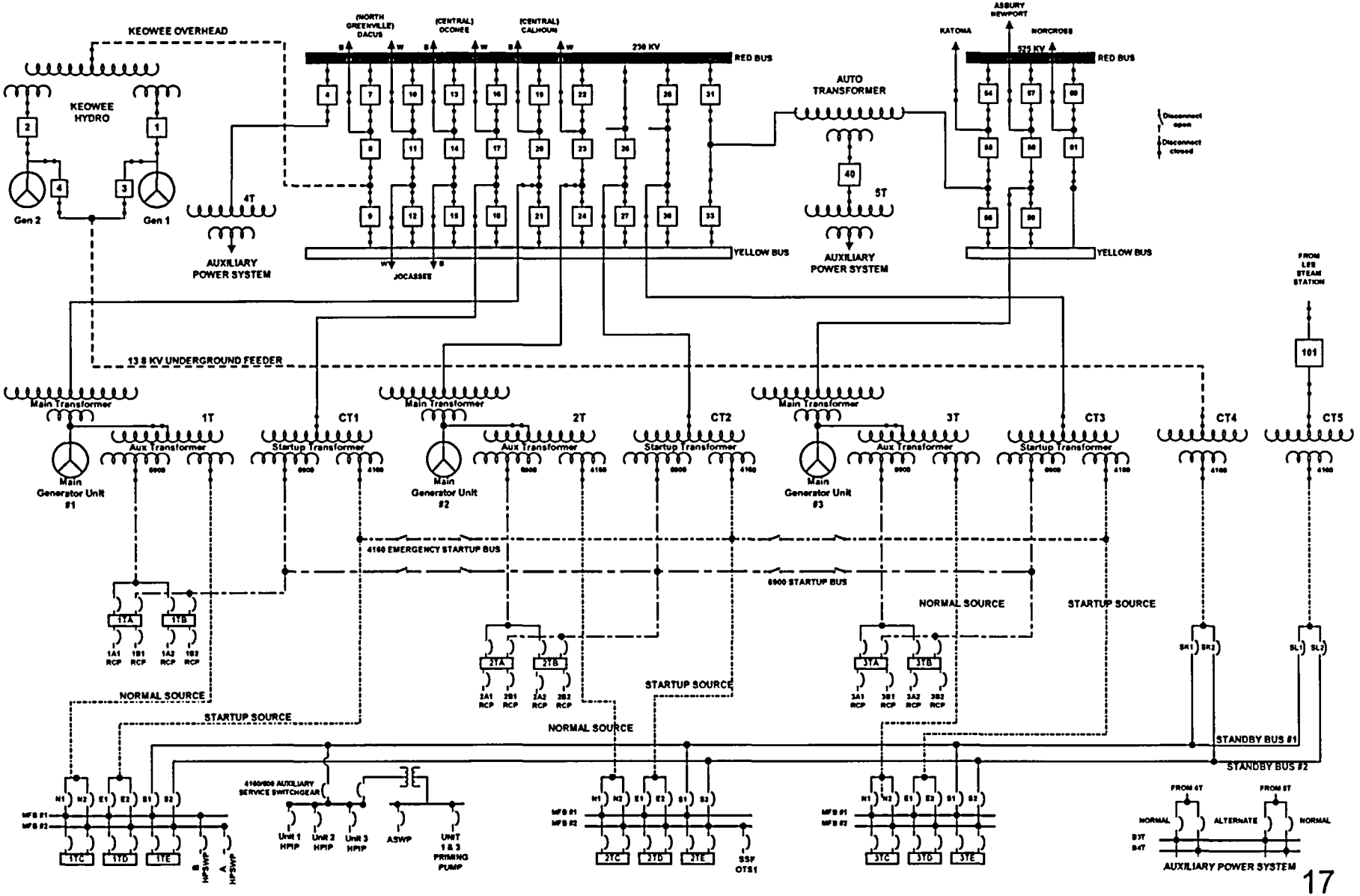
ONS ELECTRICAL DISTRIBUTION SYSTEM



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PROCESS USED TO EXPLORE POTENTIAL BACKUP POWER SUPPLIES

- Team formed to evaluate the feasibility of providing a backup diesel generator
- Assumed Keowee in dual unit outage, 3 unit LOOP caused by weather related event
  - Loss of switchyard
  - Loss of Lee CT dedicated line
  - Loss of Jocassee dedicated line
  - Loss of SSF DG
  - Temporary DGs would be required to supply power for 72 hours
- Evaluated the feasibility of multiple mitigation strategies and implementation options using following evaluation criteria
  - operator burden
  - feasibility of implementation
  - risk to plant equipment
  - recovery capability
  - cost
  - security measures
  - environmental impacts
  - overall risk/benefit

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MITIGATION STRATEGIES CONSIDERED

- Power Safe Shutdown Loads with Temporary DGs
- Power the Station ASW Switchgear with Temporary DGs
- Power the SSF with Temporary DGs

For all strategies, the temporary DG staging area would be the West side of plant near CT-5 transformer

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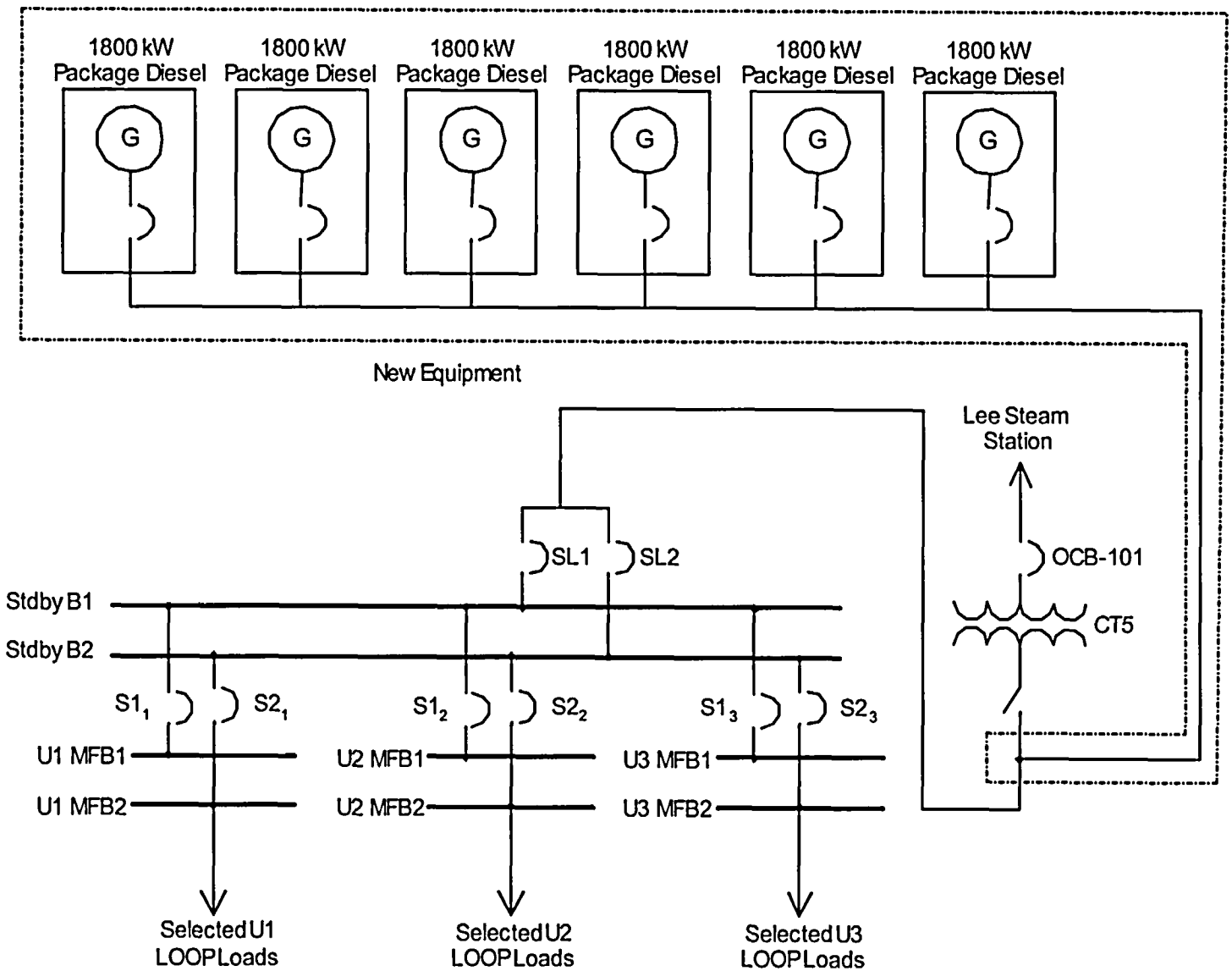
POWER SAFE SHUTDOWN LOADS WITH TEMPORARY DGS

- Power safe shutdown loads for each unit through MFBs via a connection between CT-5 and SL breakers
- Station LOOP load approx 10,000 KW requiring minimum 6 package DGs
- DG and fuel tanker staging and environmental issues
- Load sequencing issues
- Complex operating procedures & coordination between Control Rooms
- Costly and complex

POWER SAFE SHUTDOWN LOADS WITH TEMPORARY DGS



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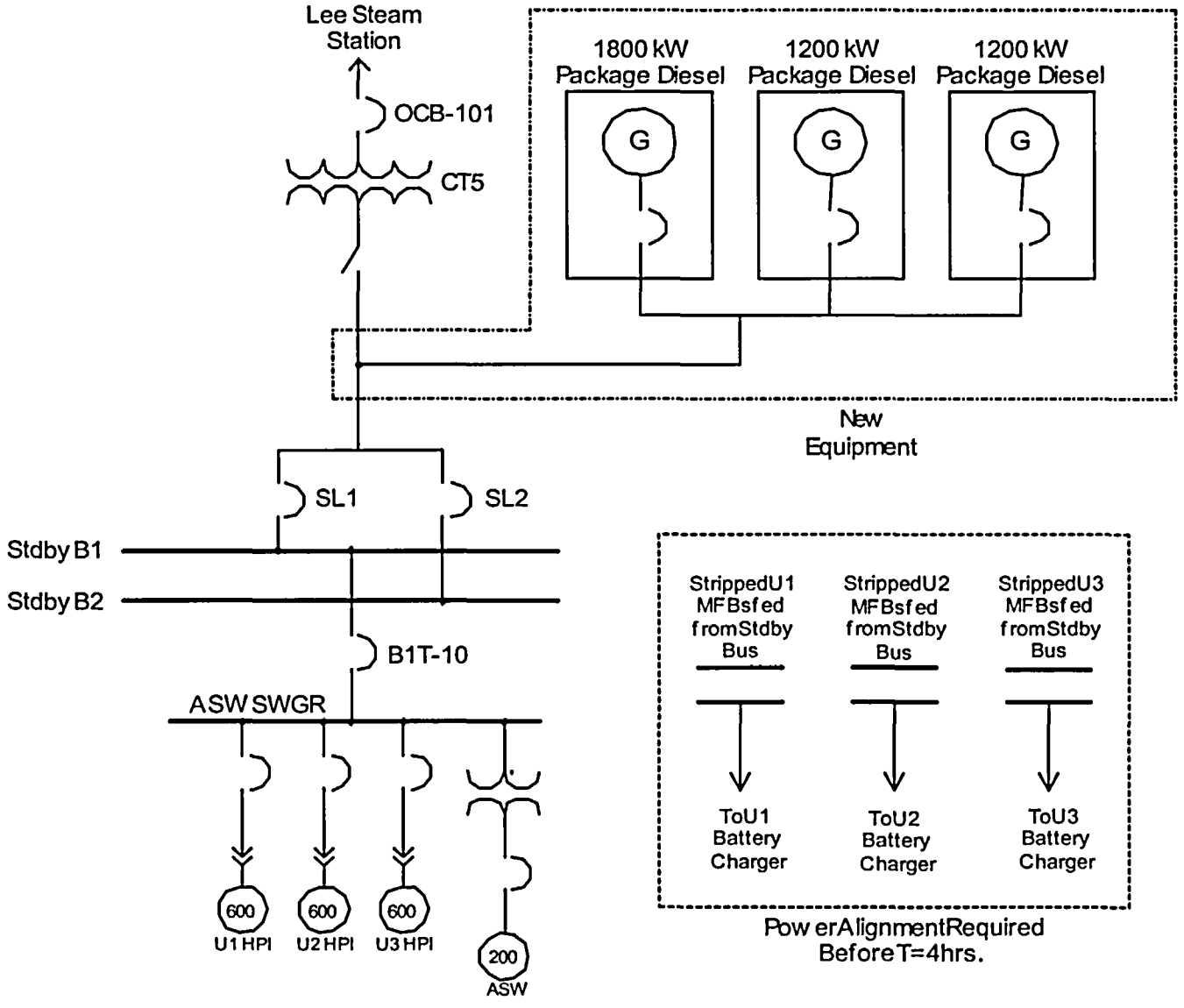
POWER THE ASW SWITCHGEAR WITH TEMPORARY DGS

- Power station ASW pump and one HPI pump for each unit through the ASW switchgear and vital battery charger via each units stripped main feeder bus breakers
- Station load approx 3000kW requiring 3 package DGs
- Requires depressurizing the SGs since ASW pump is low pressure pump
- Steam and feedwater operations are manual, requiring multiple operator actions per unit
- Complex operations procedures and intricate, coordinated operator actions between 3 control rooms
- Manual load shedding to align only a charger for each unit
- Design not well suited for 3 unit event mitigation - implementation would be challenging due to these complexities

POWER THE ASW SWITCHGEAR WITH TEMPORARY DGS



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POWER THE SSF WITH TEMPORARY DGS

- Replaces the generation that normally would be provided by the SSF DG
- SSF DG capacity is 3500 kW
- Power to the SSF can be provided via diesel generators connected to SSF Switchgear OTS1

OR

Power to the SSF connected between CT-5 and SL breakers with power routed through the plant's normal SSF connection

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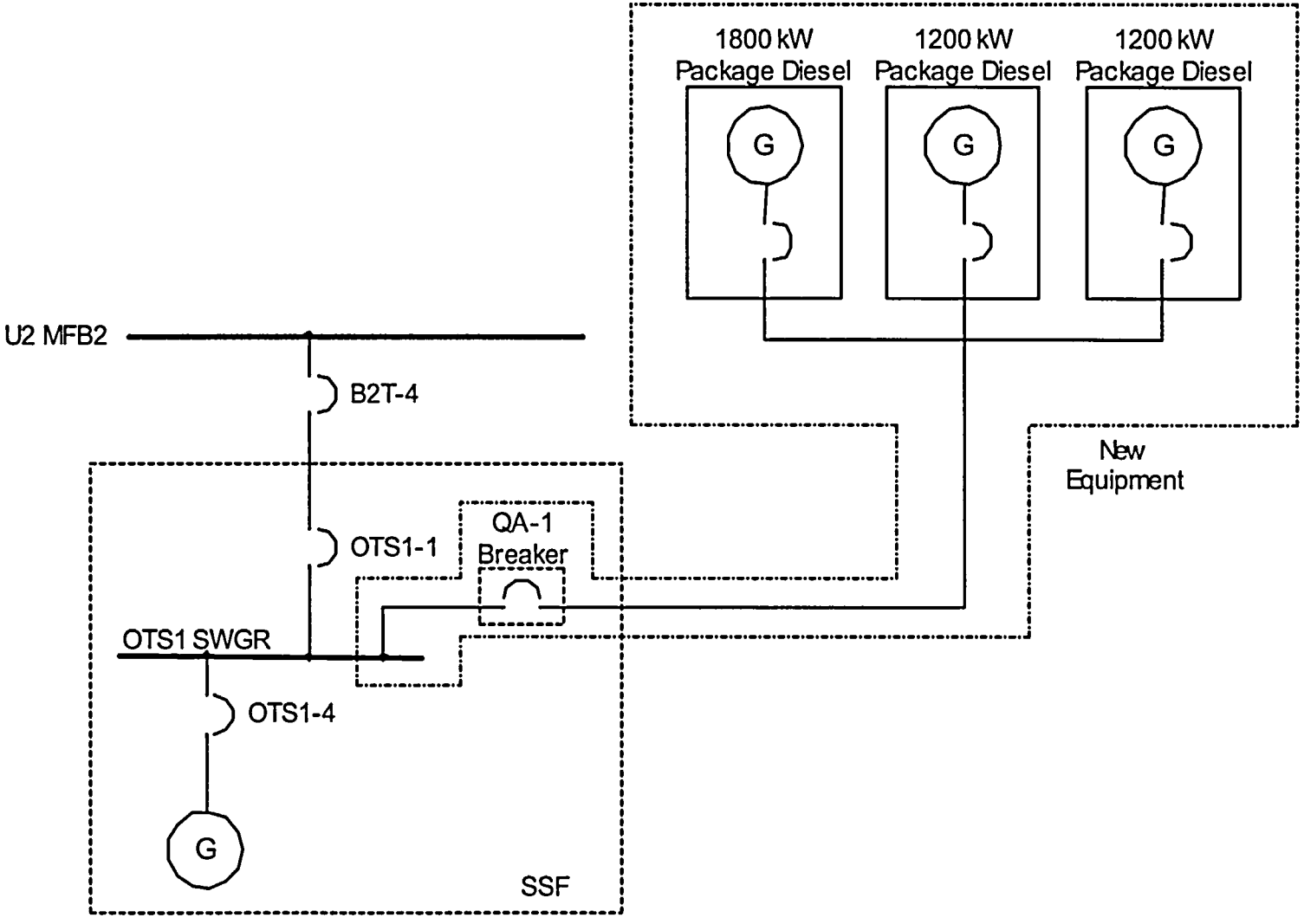
POWER THE SSF VIA DGS CONNECTED TO SSF SWITCHGEAR OTS1

- SSF load approx 3500kW requiring 3 package DGs
- Cable routed directly to SSF for connection to newly mounted safety related breaker inside the SSF that would be connected to OTS1 Switchgear
- New safety related breaker needed, equip room space limitations
- Requires modification to safety related 4kV Switchgear OTS1
- 72-hour SSF outage required to implement causing negative impact on SSF availability
- Fewer operator actions, normal SSF strategy

POWER TO THE SSF VIA DGS CONNECTED TO SSF SWITCHGEAR OTS1



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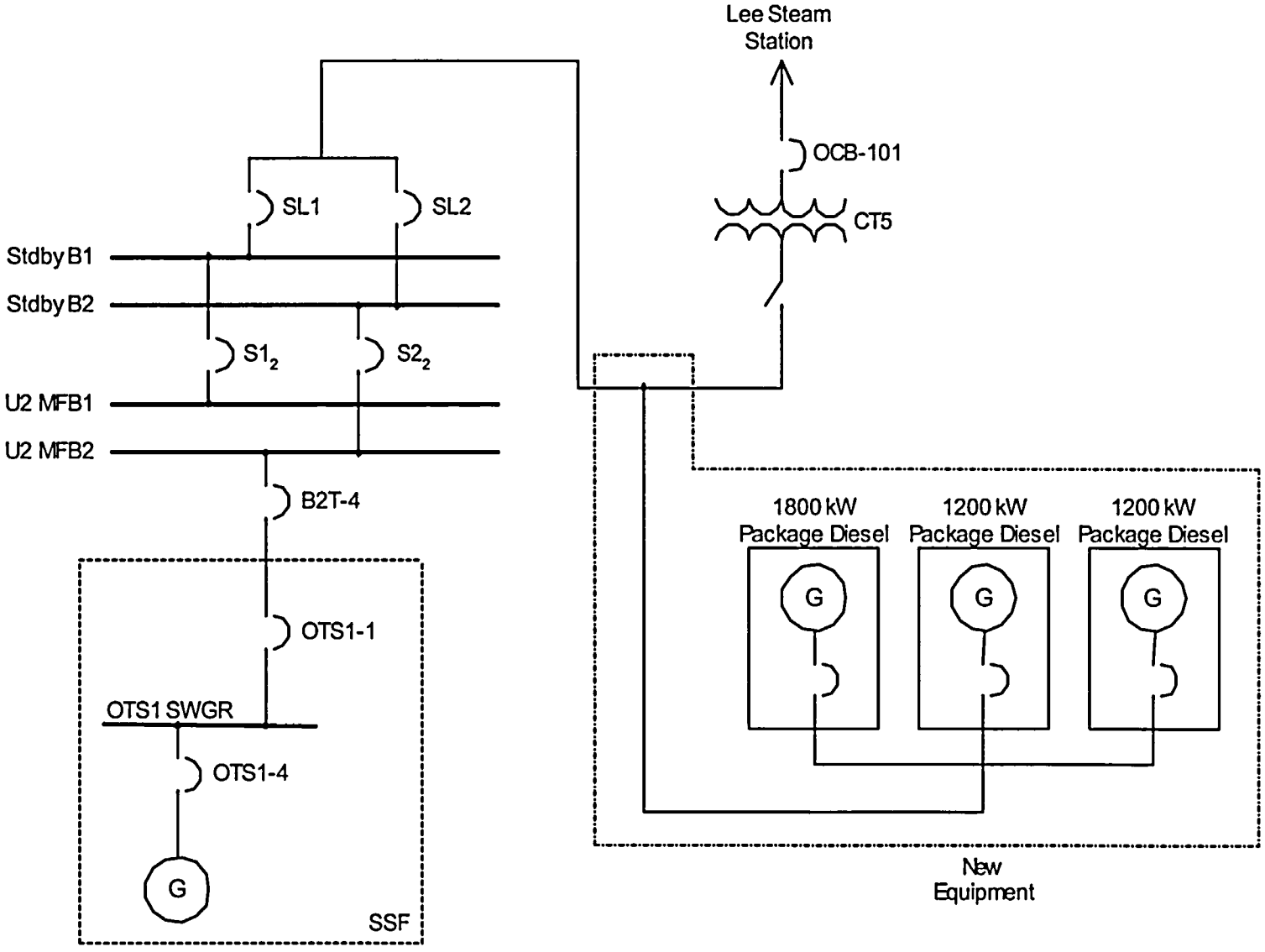
POWER TO THE SSF VIA DGS CONNECTED TO CT5 SWITCHING STATION

- Power SSF Switchgear OTS1 through the plant's normal Standby Bus and Unit 2 MFB via a connection between CT-5 and SL breakers
- SSF load approx 3500kW requiring 3 package DGs
- Load Shed issues to line up the electrical system breakers to selectively feed the SSF OTS1 Switchgear
- No safety related modification needed to OTS1 switchgear
- Additional complexity due to time-constrained operator actions for alignment in the plant and at the SSF

POWER TO THE SSF VIA DGS CONNECTED TO CT5 SWITCHING STATION



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OVERVIEW OF RISK IMPACT

- Risk Assessment Results – LAR
- Additional Risk Reduction Measures
- Temporary Diesels

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RISK ASSESSMENT RESULTS - LAR

Maintenance Activity Time Period, days	Number of KHUs inoperable	Time Period (in excess of nominal TS), hours	Maintenance Activity Time Period CDP	Cumulative CDP
1- 6	2	84	2.84E-06	2.84E-06
7-51	1	144	-2.84E-07	2.56E-06
52-55	2	36	1.22E-06	3.78E-06
56-62	1	168	-3.31E-07	**3.45E-06**

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RISK BENEFITS - ADDITIONAL RISK REDUCTION MEASURES

- New Seal LOCA Model CCDP = 7.0E-7
- Man SSF during dual unit outage CCDP= 4.8E-7
- Jocassee Hydro Unit backup CCDP=4.6E-7
- SSF DG 2 hour operability run CCDP = 4.4E-7

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RISK BENEFITS – TEMP DIESELS

- Connected to plant electrical distribution system to power Unit Safe Shutdown Loads CCDP = -7E-07 (reduction of 1E-06)
- Connected to ASW Switchgear to power ASW pump and three HPI pumps CCDP = -5E-07 (reduction of 9E-07)
- Directly or indirectly connected to SSF CCDP = 3.8E-07 (reduction of 6E-08)

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WRAP UP

- The scope of work planned for Keowee will help ensure long-term reliability of the units and assure we meet NRC commitments
- The risk reduction measures planned will provide adequate risk management during both the dual unit and extended single unit portions of each outage
- Several different options were evaluated to provide additional power, but none of the options provide a significant risk benefit considering the complexity and cost
- All additional power options evaluated would be a significant challenge to install to support the Keowee outage schedule

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- Closing Remarks