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| 1. ATTACHMENT 1 |
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| << ALARA Plan RWP 1092 LPSW >> |
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| Site: **ONS** | Unit: 1 |
| Job Title: **LPSW Piping Replacement** | |
| ALARA Plan # **2024-ONS-1-O-008** | Revision: **0** |
| Radiation Work Permit #: **1092** | |
| Dose Estimate (rem): **1.500 REM** | |
| RWP-Hour Estimate: **4167 Hours** | |
| Notes: | |
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| Prepared by:\_\_\_W. Meldrum\_\_\_\_\_\_\_\_\_\_\_\_/\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_8/22/24\_\_\_\_\_\_\_\_\_\_  ALARA Planner (print and signature) |

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| Approved by:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_  RP Supervisor or Designee (print and signature) |

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| SAC Approval verified by:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_  RP Supervisor or Designee (print and signature when required) |

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| * 1. Erase instructions, in parenthesis, under each heading and insert data as necessary. | |
| 1. | Job Description and Work Scope:  EC 423186 / WO 20637036 will replace 8” carbon steel LPSW piping with stainless steel in areas of the U1 Reactor Building outside the secondary bio-shield. A portion of work will be in close proximity to the Equipment Hatch. |
| 2. | Job History and Lessons Learned:  1EOC24 The job scope was changed to only replace the vents and drains on the header piping instead of piping itself that was originally scheduled to be replaced. The actual hours worked were 830 vs. the estimated 1733 that was originally planned.  1EOC25 There were several issues identified with this mod (inexperienced personnel,  inadequate filler material control, missed QC inspections, adherence to welding procedures, and weld quality). Reference PIP#09-8524  Other issues identified were fabbing in the reactor building, re-work for reasons mentioned above. Reference PIP#09-07965 for exceeding the dose estimate.  During the November 2007 Refueling Outage at Crystal River Nuclear Plant (CRNP) a worker received a dose rate alarm apparently due to EMF interference from welding cables. The worker was setting up and operating welding machine equipment for weld overlays to mitigate ALLOY 600 material. The cables were looped and coiled in the area to supply several work activities.  2EOC26 Work was done in periods of higher dose rates to support RCP Motor testing.  RWP Hours to install pipe in B Cavity were double those estimated. PIPs O-13-12443 & 12492 Effective Dose Rates in B Cavity were double those in A Cavity. PIP O-13-12300  Dose was 123% of revised estimate.  Scope expanded significantly due to condition of hangers.  Steel lifts caused frequent interruptions.  1EOC32 NOS QC Identified arc marks on LPSW piping  Hanger material removed from Blast and Coating facility prior to completion  Nos QC Identified 1B LPSW outlet piping not meeting minimum Clearance  NOS QC Identified Work Performed on Hanger Without Work Order |
| 3. | ALARA Historical Performance Data:  Effective Dose Rate from LPSW piping in U3 = 0.36 mR/hr |

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| **Refueling Outage # (if applicable)** | * 1. YEAR # | * 1. Dose Estimate (rem) | * 1. Dose Actual (rem) | * 1. RWP Person Hour Estimate | * 1. RWP Person Hour Actual |
| O1R32 | 2022 | **1.706/1.206** | **1.296** | 2844 | *3462* |
| O3R31 | 2022 | **.150** | **.740** | N/A | *1627* |
| O2R26 | 2014 | **4.557** | **5.721** | N/A | *4038* |
| O2R25 | 2012 | **2.970** | **3.309** | N/A | *2228* |
| O1R24 | 2009 | **1.632** | **.903** | N/A | *830* |
| O3R24 | 2009 | **.475** | **.205** | N/A | *323* |
| O1R25 | 2010 | **2.263** | **4.015** | N/A | *4710* |
| O2R24 | 2010 | **2.488** | **3.680** | N/A | *2528* |

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| 4. | ALARA Dose/Person-Hour Estimate Work Sheet: **SEE ATTACHED EXCEL** |

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| **WO Task and Job Description**  **(WO)** | **Total Person Hours** | **Effective Dose Rate**  **(EDR)** | **Total Rem for**  **Task** |
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| Total: |  | Total: |  |

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| Responsible Job Supervisor: | Date: |

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| * 1. 5. | Radiological Controls: (Include the following items, as applicable)  a. Expected Radiological Conditions:  0.1-1 mR/hr outside cavities  Contamination levels <10K dpm/100cm2  Anticipate legacy fixed contamination on piping externals  b. Dose Reduction Measures  Use high quality saw blades to reduce cut times  Prefab piping and hangers as much as is practical  Maintain awareness of system level impacts on dose rates  c. Contamination Controls  Maintain control of cutting/grinding debris  Control water coming from initial cuts  d. Airborne Control  Required for grinding or plasma arc cutting on old pipe  e. Dosimetry Requirements  Standard DLR & alarming self-reading dosimeter with transmitter  f. Stop Work Criteria   * Any unanticipated dose rate alarm - (individual) * Any dose alarm - no restart without RP Supervision approval (entire job) * Dose rates >4X higher than planned * Average contamination levels >100k βγ or 2k α / 100cm2 * Any smear showing βγ to α ratio <50 * Loss or change in engineering controls * Any air sample showing α airborne concentration >0.3 DAC   g. RP Hold Points  RP survey for external contamination prior to cutting or grinding  h. Alpha Controls  None anticipated |
| 6. | Additional requirements and information  Notify ALARA of any additional scope discovery  Scan or correctly enter WO and Task at RWP login |
| 7. | ALARA In-Progress Reviews  IPR at 50% of estimated dose |
| 8. | Enclosures: |
| 9. | ALARA Briefing Items  Sections 1,2,4,5,6 |
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