UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
245 PEACHTREE CENTER AVENUE N.E., SUITE 1200
ATLANTA, GEORGIA 30303-1200

June 27, 2022

Gregory Piefer, Ph.D.
Chief Executive Officer
SHINE Technologies, LLC
3400 Innovation Court
Janesville, WI 53546

SUBJECT: SHINE MEDICAL TECHNOLOGIES, LLC – NRC INSPECTION REPORT 05000608/2022001

Dear Dr. Piefer:

On May 13, 2022, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at SHINE Medical Technologies, LLC (SHINE) and discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report.

The inspection examined a sample of construction activities conducted under your construction permit and operating license application as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of these documents. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

No findings or violations of more than minor significance were identified during this inspection.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at http://www.nrc.gov/reading-rm/adams.html, and at the NRC Public Document Room in accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

Christopher J. Even

Digitally signed by Christopher J. Even
Date: 2022.06.24 16:39:59 -04'00'

Christopher J. Even, Chief
Construction Inspection Branch 2
Division of Construction Oversight

Docket No. 05000608
Construction Permit No. CPMIF-001

Enclosure: NRC Inspection Report (IR) 05000608/2022001
w/attachment: Supplementary Information

cc w/ encls:

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Test, Research and Training Reactor Newsletter
Attention: Amber Johnson
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SUBJECT: SHINE MEDICAL TECHNOLOGIES, LLC – NRC INSPECTION REPORT 05000608/2022001 DATED JUNE 10, 2022

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NAME	P. Carman*	J. Eargle*	C. Even	P. O'Bryan*	
DATE	05/27/2022	05/27/2022	06/10/2022	05/27/2022	

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

INSPECTION REPORT

Docket Number:	05000608
Construction Permit Number:	CPMIF-001
Report Numbers:	05000608/2022001
Applicant:	SHINE Medical Technologies, LLC
Location:	Janesville, WI
Inspection Dates:	May 9–13, 2022
Inspectors:	P. Carman, Senior Reactor Inspector, Division of Reactor Safety J. Eargle, Senior Construction Inspector, Division of Construction Oversight (DCO) C. Even, Senior Construction Inspector, DCO
Accompanying Personnel:	P. O'Bryan, Senior Reactor Operations Engineer, Office of Nuclear Reactor Regulation, Vogtle 3 & 4 Project Office
Approved By:	Christopher J. Even, Chief Construction Inspection Branch 2 Division of Construction Oversight

Enclosure

EXECUTIVE SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the applicant's performance by conducting a mechanical, welding, and quality assurance inspection at SHINE Medical Technologies, LLC (SHINE). The NRC program for overseeing the construction of non-power utilization facilities is described in Inspection Manual Chapter (IMC) 2550, Non-Power Production and Utilization Facilities (NPUFs) Licensed Under 10 CFR Part 50: Construction Inspection Program (CIP).

List of Findings and Violations

No findings or violations of more than minor significance were identified.

Additional Tracking Items

None.

REPORT DETAILS

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess applicant performance and compliance with Commission rules and regulations, construction permit conditions, operating license application conditions, site procedures, and standards.

SAFETY-RELATED ITEMS AND SERVICES DURING CONSTRUCTION

a. Inspection Scope

The inspectors conducted interviews, reviewed documents, and observed construction activities associated with piping systems, pipe support and restraints, mechanical components, and nuclear welding to determine if:

- work activities were performed in accordance with the Final Safety Analysis Report (FSAR), construction specifications, drawings, and work procedures
- specifications and procedures meet the requirements of applicable codes
- the applicant's system for preparing, reviewing, and maintaining records was functioning properly
- records reflected work accomplishment consistent with specifications and procedures
- as-built conditions met the design requirements, specifications, and drawings
- the implementation of the quality assurance program was effective; and deviations from requirements were appropriately resolved

Piping Systems (IP 69020, Appendix D)

The inspectors reviewed the construction specification for nitrogen gas piping, the construction specification for primary and process piping, the construction specification for radioactive drain system (RDS) embedded piping, and the inspection plan for RDS embedded piping to determine if requirements specified within were consistent with American Society of Mechanical Engineers (ASME) Code B31.3 and adequately addressed the following areas: 1) receipt inspection and storage, 2) use of specified materials, 3) fabrication and installation, and 4) inspection, testing, non-destructive examination, and records.

The inspectors reviewed a sample of procurement, fabrication, installation, and inspection records to determine if piping activities were accomplished in accordance with construction specifications, drawings, work procedures, and applicable codes and regulations. The inspectors evaluated the following samples:

- nitrogen purge system (N2PS) piping 0-N2PS-041-3/4"-032
- RDS piping 0-RDS-011-2"-019
- RDS embedded piping 0-RDS-054-4"-101
- RDS embedded piping spool PS-90061-027-03
- weld 6 on piping 0-N2PS-041-3/4"-032
- weld 18C1 on piping 0-RDS-011-2"-019
- repair weld 58-1 on piping 0-RDS-054-4"-101
- weld FW-3 connecting RDS pipes PS-90061-027-02 and PS-90061-027-03

- weld FW-6 connecting RDS pipes PS-90061-028-01 and PS-90061-028-02
- weld FW-2 connecting RDS pipes PS-90061-027-01 and PS-90061-027-02

For the samples above, the inspectors reviewed procurement records, material records, welding records, and design drawings to determine if the pipe material and weld filler metal type and combination was in accordance with the applicable specification, design drawings, and ASME Code B31.3 The inspectors reviewed a sample of material test reports from the samples above to determine if chemical composition, mechanical properties, and heat treatment met the applicable ASME Boiler and Pressure Vessel Code (BPVC) Section II requirements, when applicable. The inspectors sampled the following materials:

- stainless steel TP347 piping for 0-N2PS-041-3/4”-032
- RDS embedded piping spool PS-90061-027-03
- weld filler metal used in FW-3 connecting PS-90061-027-02 and PS-90061-027-03
- weld filler metal used in FW-6 connecting PS-90061-028-01 and PS-90061-028-02
- weld filler metal used in weld 18C1 of piping 0-RDS-011-2”-019

The inspectors reviewed fabrication and inspection records contained in the work packages of the samples above (WP-N2PS-PF-PIPING-001, WP-RDS-PF-DIV45-PIPE-001, and WP-RDS-PF-PIPING-001) to determine if on-site installation and fabrication activities were conducted in accordance with applicable quality assurance (QA) implementing procedures, applicable specifications, design and shop drawings, and applicable codes and standards. The inspectors reviewed inventory request forms, inventory issue forms, weld tracking forms, daily weld reports, welding filler material requisitions, weld filler material logs, weld maps, and test reports to determine if the samples above were fabricated and installed in accordance with the applicable specification and design drawings. The inspectors reviewed these documents to determine if hold points were established to allow for inspection of activities, inspections were performed, and material traceability was maintained from receipt to installation in accordance with QA implementing procedures and the applicable specifications.

The inspectors reviewed radiography examination reports for weld 6 on piping 0-N2PS-041-3/4”-032, weld 58-1 on piping 0-RDS-054-4”-101, and weld FW-2 connecting RDS pipes PS-90061-027-01 and PS-90061-027-02 to determine if nondestructive examination (NDE) was performed in accordance with the applicable pipe specification and ASME Code B31.3. The inspectors reviewed radiograph films for the weld samples above. The inspectors reviewed radiograph attributes, such as weld defects, film quality, film density, and image quality indicator (IQI) selection and location to determine if the radiographs were conducted and evaluated in accordance ASME Code requirements.

The inspectors observed in-process manual gas tungsten arc welding (GTAW) on the root pass for weld 18C1 on piping 0-RDS-011-2”-019 to determine if the pipe was welded in accordance with the appropriate welding procedure specification (WPS) and ASME Code B31.3. Specific inspection activities are discussed in the section below (Nuclear Welding [IP 69020, Appendix L]).

The inspectors reviewed three nonconformance reports (NCRs) associated with repairs and additional NDE on RDS piping (NCRs 19-0006, 19-0011, and 19-0015) to determine if nonconforming items were controlled in accordance with QA implementing procedures. The inspectors reviewed the NCRs to determine if the disposition was approved by the designated Baker and SHINE personnel and required documentation was generated in

accordance with QA implementing procedures. The inspectors reviewed the technical justifications and a sample of fabrication and inspection records within the NCRs to determine if they addressed why the conditions were acceptable relative to the item's design basis in accordance with QA implementing procedures.

Pipe Support and Restraints (IP 69020, Appendix E)

The inspectors reviewed the construction specifications governing piping support and restraint procurement, fabrication, and installation to determine if the requirements specified within were consistent with the commitments in the FSAR and adequately addressed the following areas: 1) receipt inspection and storage, 2) use of specified materials and components, 3) installation and erection, and 4) inspection, testing, non-destructive examination, and records.

The inspectors reviewed a sample of procurement, fabrication, installation, and inspection records to determine if piping support and restraint activities were accomplished in accordance with construction specifications, drawings, work procedures, and applicable codes and regulations. The inspectors evaluated the following samples:

- pipe supports for the vacuum transfer system (VTS) piping in the north trench of the radioisotope production facility (RPF) (sections 70 through 82)

For the samples above, the inspectors reviewed receipt inspection reports and a sample of procurement and material records to determine if the pipe support material type and grade was in accordance with the construction specification for pipe support procurement and fabrication and design drawings. The inspectors reviewed receipt inspection reports for the samples above to determine if quality control (QC) inspections were performed and material traceability was maintained from the supplier to receipt in accordance with QA implementing procedures.

Mechanical Components (IP 69020, Appendix F)

The inspectors reviewed the construction specification for process tanks installed in the RPF and design drawings for the east RDS sump tank (0-RDS-T-001, serial # J-2750-2) to determine if requirements specified within were consistent with ASME BPVC Section VIII Division 1 and adequately addressed the following areas: 1) receipt inspection and storage, 2) use of specified materials, 3) fabrication and installation, and 4) inspection, testing, nondestructive examination, and records.

The inspectors reviewed a sample of procurement, fabrication, and inspection records for the east RDS sump tank (0-RDS-T-001, serial # J-2750-2) to determine if construction activities were accomplished in accordance with the specification for process tanks, drawings, and applicable codes. The inspectors evaluated the following parts and welds for the east RDS sump tank:

- shell inner, item no. 11
- bottom ring, item no. 2
- 1/2" x 3/4" nozzle reducer, item no. 103
- weld 201: inner shell long seam
- welds 205, 206, 207: bottom plate seams
- weld 112: 1/2" x 3/4" nozzle reducer (item no. 103) to 3/4" pipe (assembly D)

For the samples above, the inspectors reviewed the receipt inspection report and a sample of procurement and material records to determine if the plate, pipe, and weld filler metal type and grade was in accordance with the construction specification for process tanks, design drawings, and ASME BPVC Section VIII Division 1. The inspectors reviewed a sample of material test reports from the samples above to determine if chemical composition, mechanical properties, and heat treatment met the applicable ASME BPVC Section II requirements, when applicable.

For the weld samples above, the inspectors reviewed visual examination and radiographic test reports to determine if NDE was performed in accordance with the specification for process tanks and ASME BPVC Section VIII Division 1. The inspectors reviewed a sample of radiograph films for the weld samples selected. The inspectors reviewed radiograph attributes, such as weld defects, film quality, film density, and image quality indicator (IQI) selection and location to determine if the radiographs were conducted and evaluated in accordance ASME Code requirements.

The inspectors reviewed a hydrostatic test report to determine if a hydrostatic test was performed and meet the requirements of the specification for process tanks and ASME BPVC Section VIII Division 1.

The inspectors observed storage conditions of the east RDS sump tank (0-RDS-T-001, serial # J-2750-2) at SHINE's off-site storage facility and the west RDS sump tank (0-RDS-T-002, serial # J-2750-3) in the RPF prior to installation. The inspectors observed storage conditions to determine if storage area, material markings and labeling, storage protection, segregation, and boundary requirements were in accordance with QA implementing procedures. The inspectors reviewed qualification records for the inspector that performed the receipt inspection for the RDS sump tanks. The inspectors reviewed these reports to determine if the inspector was qualified for the activities they were performing, and to determine if they meet examination and proficiency requirements in accordance with QA implementing procedures.

Nuclear Welding (IP 69020, Appendix L)

The inspectors reviewed a sample of QA implementing procedures related to welding and inspections to determine if they contained requirements of codes committed to in the FSAR and required in the construction specifications for primary and process piping, radioactive drain system embedded piping, nitrogen gas piping, and tanks. The inspectors reviewed these procedures to verify they established requirements for:

- maintaining material traceability
- development and qualification of ASME welding procedure specifications (WPSs)
- qualification and management of qualification of welders and welding operators
- control of weld filler metal
- documentation of welding activities
- workmanship and standard practices for compliance with ASME BPVC Section VIII Division 1 and ASME Code B31.3
- welding inspection and testing in accordance with ASME BPVC Section VIII and ASME Code B31.3

The inspectors observed in-process manual GTAW on the root pass for weld 18C1 on piping 0-RDS-011-2”-019 to determine if the pipe was welded in accordance with WPS 8-3-1 and ASME Code B31.3. The inspectors reviewed heat/lot markings on the ER316L weld rods and pipe, welding filler material requisition forms, weld filler material logs, and the weld tracking form to determine if material traceability was controlled and the pipe material and weld filler metal type, size, and combination were in accordance with the WPS, QA implementing procedures, and ASME Code B31.3. The inspectors observed amperage settings, weld speed, and interpass temperatures to determine if the values were within the range listed in the WPS.

The inspectors reviewed two WPSs used in N2PS and RDS pipe welding to determine if they were developed in accordance with QA implementing procedures and met the requirements of ASME BPVC Section IX. The inspectors reviewed qualification records for a sample of welders who performed welds on the N2PS and RDS samples in the piping section above (Piping Systems [IP 69020, Appendix D]) to determine they were qualified and maintained proficiency for the weld processes used in accordance with QA implementing procedures and ASME BPVC Section IX.

The inspectors inspected the weld rod room to determine if storage conditions, material markings, weld filler material issuance, and material traceability meet QA implementing procedure requirements.

The inspectors inspected additional welding activities, as discussed in the sections above (Piping Systems [IP 69020, Appendix D] and Mechanical Components [IP 69020, Appendix F]).

b. Findings

No violations of more than minor significance were identified.

QUALITY ASSURANCE PROGRAM IMPLEMENTATION

a. Inspection Scope

The inspectors conducted interviews, reviewed QA documents, and observed construction activities to determine if the applicant has effectively implemented its QA program during construction activities in accordance with applicable sections of the SHINE quality assurance program description (QAPD), the Baker QAPD, implementing procedures, and American National Standards Institute/American Nuclear Society (ANSI/ANS)-15.8-1995. Where the applicant has delegated portions of the QA program implementation to other organizations working on behalf of the applicant, the inspectors conducted interviews, reviewed applicable documents, and observed activities for those organizations.

Design Control (Appendix C)

The inspectors reviewed five field change requests (FCRs) associated with design changes to the nitrogen gas piping specification and the primary and process piping specification. The inspectors reviewed the FCRs to determine if the requirements of SHINE procedures 1200-09-04, “Design Control Program,” Revision 0 and 1200-01-06, “Engineering Change Control,” Revision 3 were adequately implemented. The inspectors reviewed the FCRs to determine if they received the proper level of engineering review and approval; all affected

calculations, drawings, and analyses were identified; and the specifications were updated or in the process of being updated to reflect the design changes in accordance with 1200-09-04 and 1200-01-06.

Document Control (Appendix F)

The inspectors reviewed the document control program to verify if the program was being implemented in accordance with the procedures. The inspectors toured the Baker document control office and interviewed the personnel in charge of issuing work packages to determine if the requirements of NQAP SHINE-6.01, "Controlling Documents," Revision 3 were adequately implemented. Specifically, the inspectors discussed the document change process to verify if work packages were being issued with the most recent design changes. The inspectors also toured the field to verify if work packages were being properly controlled in accordance with the procedures.

Control of Purchased Items and Services (Appendix G)

The inspectors reviewed records associated with the evaluation of Dubose National Energy Services, manufacturer of safety-related tanks and components, and Joseph Oat Corporation, supplier of safety-related design, analysis, and fabrication of vessels and components, to evaluate the capability of the companies to supply these safety-related components in accordance with the SHINE QA Program requirements. The inspectors reviewed a triennial evaluation to determine if measures were established to control the supplier's performance in accordance with the SHINE QA implementing procedure 2000-01-08, "Assessments," Revision 8. The inspectors also reviewed the assessment to verify if the assessment was performed in accordance with QA procedure 2000-01-08, "Assessments," Revision 8. The inspectors reviewed Baker's and SHINE's approved suppliers lists to determine if the suppliers for annular tanks (Joseph Oat Corporation), safety-related piping (Dubose National Energy Services and Consolidated Power Supply), and NDE services (Mistras) were selected in accordance with NQAP SHINE-7.01, "Controlling Purchases of Items and Services," Revision 4 and 1600-01-01, "Procurement," Revision 12.

Control of Special Processes (Appendix I)

The inspectors reviewed records and observed work activities to determine if the following Baker procedures were implemented during welding activities:

- NQAP SHINE-2.02, "Co-worker Qualification and Certification," Revision 2
- NQAP SHINE-9.01, "Controlling Special Processes," Revision 2
- CI-SHINE-9.01-1, "Welding Procedure Development and Qualification," Revision 2
- CI-SHINE-9.01-2, "Welder and Welding Operator Performance Qualification," Revision 2
- CI-SHINE-9.01-3, "Welding Electrode Control," Revision 3
- CI-SHINE-9.01-4, "Welding Documentation Requirements," Revision 1
- CI-SHINE-9.01.6, "ASME Welding Performance and Workmanship Standard," Revision 1

Specific inspection activities related to the control of special processes, specifically welding and NDE, are discussed in the sections above (Piping Systems [IP 69020, Appendix D]), Nuclear Welding (Mechanical Components [IP 69020, Appendix F, and IP 69020, Appendix L]).

Inspection (Appendix J)

The inspectors reviewed receipt inspection reports, visual examination reports, and radiography examination reports to determine if inspections were conducted in accordance with Baker procedure NQAP SHINE-10.01, "Performing Inspections," Revision 3. The inspectors reviewed qualification records for two receipt inspectors to determine if they were qualified in accordance with SHINE procedure 2000-01-22, "Inspection and Test Personnel Qualification," Revision 1. Refer to the sections above (Piping Systems [IP 69020, Appendix D] and Mechanical Components [IP 69020, Appendix F]) for specific samples and inspection activities.

Control of Measuring and Test Equipment (Appendix L)

The inspectors walked down the measuring and test equipment (M&TE) facility to verify if M&TE was controlled in accordance with procedures MNT-01-04-01, "Measuring and Test Equipment (M&TE) Control and Use," Revision 0 and SHINE NQAP-12.01, "Controlling Measuring and Test Equipment," Revision 1. The inspectors sampled two torque wrenches, a weld rod oven pyrometer, and a densometer to verify if the equipment was labeled, properly stored, and within the calibration frequency in accordance with the equipment requirements. The inspectors also observed the process for when M&TE was out of calibration to verify it was properly controlled in accordance with procedures. The inspectors reviewed these samples to verify if the M&TE had a frequency of calibration, unique identification number, and proper storage location in accordance with procedures.

Handling, Storage, and Shipping (Appendix M)

The inspectors walked down two SHINE off-site component storage facilities to verify if the storage of components was in accordance with procedure 1600-01-19, "Handling, Storage, Shipping, Identification, and Control of Items," Revision 3. The inspectors reviewed the storage of process piping, safety-related cables, and annular tanks that were accepted to verify if they had a tag that identified the part number, quality level, storage level, item description, and shelf life in accordance with the procedure. The inspectors reviewed the requirements for the Level B storage area to verify if the building satisfied the temperature requirements. The inspectors reviewed the items' storage requirements to verify if the items were being stored in accordance with the storage level requirements. The inspectors reviewed material holds for N2PS nitrogen tanks and the A and B subcritical assembly system to verify they were controlled and unable to be released until resolved. The inspectors reviewed a sample of qualification records for receipt inspection inspectors to determine if they were qualified for the activities they were performing, and to determine if they meet examination and proficiency requirements in accordance with QA implementing procedures.

Control of Nonconforming Items and Services (Appendix O)

The inspectors reviewed three NCRs associated with repairs and additional NDE on RDS piping (NCRs 19-0006, 19-0011, and 19-0015) to determine if nonconforming items were

controlled in accordance with Baker procedure NQAP SHINE-15.01, “Controlling Nonconforming Items,” Revision 4. The inspectors reviewed the NCRs to determine if the disposition was approved by the designated Baker personnel and required documentation was generated in accordance with NQAP SHINE-15.01. The inspectors reviewed the technical justifications and a sample of fabrication and inspection records within the NCRs determine if they addressed why the conditions were acceptable relative to the item’s design basis in accordance with NQAP SHINE-15.01.

Corrective Actions (Appendix P)

The inspectors reviewed 18 issue management reports (IMRs) to verify if SHINE was identifying and resolving issues in accordance with procedure 2200-01-01, “Issue Management,” Revision 7. The inspectors attended an IMR screening meeting to verify if timeliness requirements were satisfied and appropriate classification and significance level were assigned to every issue in accordance with the procedure. The inspectors reviewed the IMRs to verify if completion of assigned actions were documented, due date extension requests were requested, and the required fields were filled out in accordance with the procedure.

The inspectors reviewed two apparent cause reports and one root cause report to verify if the reports were conducted in accordance with procedures 2200-01-06, “Apparent Cause Evaluation,” Revision 0, and 2200-01-07, “Root Cause Evaluation,” Revision 0, respectively.

Quality Records (Appendix Q)

The inspectors observed SHINE and Bakers’ storage conditions of radiograph film to verify if the temperature and physical storage requirements were in accordance with procedures 2100-01-02, “Records Management,” Revision 0 and NQAP SHINE-17.01, “Controlling Quality Assurance Records,” Revision 4.

Assessments (Appendix R)

The inspectors reviewed one internal assessment, two annual supplier assessments of Joseph Oat Corporation, and an assessment of Dubose National Energy Services to verify if the assessments were performed in accordance with SHINE QA Program procedure NQAP SHINE-18.01, “Performing Assessments,” Revision 2.

b. Findings

No violations of more than minor significance were identified.

EXIT MEETING SUMMARY

On May 13, 2022, the inspectors presented the inspection results to Dr. Gregory Piefer and other members of the applicant’s staff. The inspectors verified no proprietary information was retained or documented in this report.

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

J. Arellano, Baker, Project Quality Assurance Manager
J. Bartelme, SHINE, Director of Licensing
J. Costedio, SHINE, Vice President of Regulatory Affairs & Quality
A. Cowne, SHINE, Director of Engineering Construction
J. Getchius, SHINE, Senior Licensing Engineer
J. Hausfeld, Baker, Director of Quality
M. Jorn, Baker, Project Executive
A. Shuler, Baker, Quality Manager
R. Stover, Baker, Quality Manager
D. Truman, SHINE, Senior Procurement Specialist

LIST OF DOCUMENTS REVIEWED

Assessments/Evaluations
EXAS-2020-0002, SHINE Supplier Assessment of Dubose National Energy Services, Rev. 0
QUAL-2020-0047, JOC Triennial Supplier Evaluation, 12/14/2020
SA-2022-0001, NRC IMC 2550 CAP Effectiveness and Annual QAPD Implementation Inspection Readiness Assessment, 04/27/2022
SURV-2021-0030, JOC Surveillance, 03/24/2021
SURV-2022-0008, JOC Surveillance, 03/21/2022

Corrective Action Documents
IMR 2022000283
IMR 2022000213
IMR 2022000100
IMR 2021000733
IMR 2021000172
IMR 2020000508
IMR 2020000282
IMR 2020000275
IMR 2019000394
IMR 2019000346
IMR 2019000289
IMR 2019000266
IMR 2020000287
IMR 2020000155
IMR 2020000363
IMR 2020000055
IMR 2022000195
IMR 2022000169
DCR-UPSS-004, UPSS DCD NSR Bus, 07/20/2021
RCE-A152816, Coworker Falling with Unsecured Reinforcing Wall Curtain During Construction, 09/11/2020
ACE-A139789, Adverse Trend in Process Engineering Piping, 05/05/2020

Corrective Action Documents Resulting from Inspection

IMR 2022000380, Typo in ASME Code reference in SPEC-PR-0002 (NRC ID), 4/29/2022
IMR 2022000424, N2PS Process Piping System ITP N2PS 01 has clerical error for line item 3, 5/10/2022
IMR 2022000428, Evaluate removing 1600-01-12 from QAPD, 5/11/2022
IMR 2022000429, Temporary Field Storage Signs Did Not Display the Storage Level, 5/11/2022
IMR 2022000431, Welder lacking a proficiency weld in Welder Qualification Test Record, 5/11/2022
IMR 2022000432, Weld Filler Material issued not in accordance with Baker Work Instruction 9.01-3, 5/11/2022
IMR 2022000435, Baker NCR-19-0006-R1 has several clerical issues on the record, 5/12/2022
IMR 2022000438, Discrepancies found in Weld Filler Material Issuance During Repair Welds for Baker NCR-19-0015, 5/12/2022

Drawings

0-N2PS-041-3/4”-032, N2PS-Nitrogen purge system, Piping Isometric, Rev. 0
DWG-66-90061-07, RDS Embedded Piping, Rev. 3
DWG-66-90061-09, RDS Embedded Piping (0-RDS-054-4”-101), Sheet 2 of 2, Rev. 2
DWG-FSTR-1957, RPF Areas Trench Pipe Supports Location Plan and General Notes, Rev. 0
DWG-FSTR-1970, Trench Piping Supports Section 70, Rev. 0
DWG-FSTR-1971, Trench Piping Supports Section 71, Rev. 0
DWG-FSTR-1972, Trench Piping Supports Section 72, Rev. 0
DWG-FSTR-1973, Trench Piping Supports Section 73, Rev. 0
DWG-FSTR-1974, Trench Piping Supports Section 74, Rev. 0
DWG-FSTR-1975, Trench Piping Supports Section 75, Rev. 0
DWG-FSTR-1976, Trench Piping Supports Section 76, Rev. 0
DWG-FSTR-1977, Trench Piping Supports Section 77, Rev. 0
DWG-FSTR-1978, Trench Piping Supports Section 78, Rev. 0
DWG-FSTR-1979, Trench Piping Supports Section 79, Rev. 0
DWG-FSTR-1980, Trench Piping Supports Section 80, Rev. 0
DWG-FSTR-1981, Trench Piping Supports Section 81, Rev. 0
DWG-FSTR-1982, Trench Piping Supports Section 82, Rev. 0
DWG-PR-17-001, Target Solution Preparation Tank Common Nozzle Details, Rev. 0
DWG-RDS-11-001, Sump Tanks and RDS Lift Tank, Rev. 2
DWG-RDS-17-006, RDS East RDS Sump Tank Outline Drawing, Rev. 0
DWG-RDS-17-007, RDS East RDS Sump Tank Shell and Details, Rev. 0

Field Change Requests

FCR-N2PS-0008, Revise SPEC-N2PS-0002 for RT Requirements, 10/15/2021
FCR-N2PS-0011, Revise SPEC-N2PS-0002 for Additional Pipe Materials, 11/18/2021
FCR-N2PS-0018, Revise SPEC-N2PS-0002 Piping Sleeves Below Grade Requirements, 12/17/2021
FCR-PR-0001, Revision of Scope to include (RDS) - Radioactive Drain System Non-Embedded Piping, 1/21/2022
FCR-PR-0002, Addition of Weld and Bend Fabrication Allowances, 1/21/2022

Inspection Plans

IP RDS-0002, Radioactive Drain System (RDS) Embedded Piping Specification RDS-0002, 3/10/2022
ITP N2PS 01, Inspection of welded piping and piping components, Rev. 1

Inspection Reports

6.01-5, Report 10.01-5-001, RDS Pipe Receipt Inspection, 11/16/2021
10.01-4-003, Weld Filler Material Receipt Inspection, Heat 551527 – Lot CF00667, 12/09/2019
10.01-4-006, Weld Filler Material Receipt Inspection, Heat 551527 – Lot DF0677, 12/30/2019
11.01-3, Process Piping Pressure Test Inspection Checklist, N2PS-Nitrogen Purge System, Work Package: N2PS-PF-PIPING-001, 2/16/2022
IR-5985, Receipt Inspection Form for Radioactive Drain Sump Tank, Item # MT.001417-P1, 11/3/2021
IR-6454, Receipt Inspection Form for PO-602750, 12/21/2021
IR-6627, Receipt Inspection Form for Item # MT.001423_P1, Heat: 55131, 2/4/2022

Material Records

Certificate of Conformance/Compliance/CMTR, PO: K-2020-0059-APP-001, Serial No.: 352151, Heat: 55131, 2/23/2021
EN 10204:2004/3.1, Inspection Certificate, PO: K-2020-0059-APP-001, Item # 4, Heat: 55131
EN 10204 3.1, Certified Material Test Report, PO: 626485, Lot/Heat: CT0663-753639, 6/3/2019
EN 10204 3.1, Certified Material Test Report, PO: 633118, Lot/Heat: DT0986-756595, 1/20/2021
EN 10204 3.1, Certified Material Test Report, PO: 906776 CO 1, Lot: 15D25E, 9/26/2018
EN 10204 3.1, Certified Material Test Report, PO: 907931, Lot/Heat: DF0667-551527, 03/06/2019
EN 10204 3.1, Certified Material Test Report, PO: 907995, Lot/Heat: CF0667-551527, 05/21/2019
EN 10204 3.1, Certified Material Test Report, PO: 908228, Lot/Heat: AT0857-755535, 3/9/2020
EN 10204 3.1, Certified Material Test Report, PO: 908732, Lot/Heat: CT1007-756896, 9/30/2021
JOS045-12-28-955570-1, Test Certification for 2750-2/2, Heat: 523212, 1/6/2021
JOS045-12-28-955570-4, Test Certification for 2750-2/11, Heat: 528853, 1/6/2021
Material Test Report from CGP MFG, Inc. for PO: A256-1185, Heat: EQD3, 12/7/2020
Material Test Report from Energy & Process Corporation for PO: 70738, J-2750-2 Item 103, Heat EQD3, 1/8/2021
SHINE-IRF-2022-0012, Inventory Issue/Return, 2/4/2022
SHINE-IRF-2022-0014, Inventory Issue/Return, 2/8/2022
SHINE-IRF-2022-0141, Inventory Issue/Return, 4/28/2022

Miscellaneous

596-RT-101, Densitometer Model 301 Serial 025660 Calibration Record, 03/24/2022
7.01-3, SHINE Approved Suppliers List (ASL), 5/9/2022
SHINE Approved Suppliers List, Rev. 43
SHINE Approved Suppliers List, Rev. 0

Nonconformance Reports

NCR-19-0006, RDS Pipe Spool PS-90061-101-01 Fabricated In The Wrong Orientation, 12/04/2019
NCR-19-0011, RDS Pipe Spool PS-90061-101-1 Observed That A Circumferential Weld Internal Surface Exhibited Rejectable Visual Characteristics, 12/14/2020
NCR-19-0015, After 100% Radiological Testing Exam RDS Pipe Spools Have Deficient Welds, 02/14/2020

Nondestructive Examination Records

Nondestructive Examination Report from Joseph Oat Corporation for Job 2750-2, Hydrostatic, 6/10/2021
Radiographic Reader Sheet from Joseph Oat Corporation for Job 2750-2, Weld 112, 3/25/2021
Radiographic Reader Sheet from Joseph Oat Corporation for Job 2750-2, Weld 201, 3/24/2021
Radiographic Reader Sheet from Joseph Oat Corporation for Job 2750-2, Welds 205, 206, 207, 4/5/2021
Radiography Examination Report from Mistras, Weld-6, 0-NZPS-041-3/4”-032, 2/9/2022
Radiography Examination Report from Mistras, Weld #58, DWG -66-90061-09 sheet 2, 12/18/2019
Radiography Examination Report from Mistras, 58, DWG -66-90061-09 sheet 2, 1/3/2020
Radiography Examination Report from Mistras, FW-2, DWG: 66-90061-07 R3, 1/27/2020
Visual Examination Report from Joseph Oat Corporation for Job 2750-2, Weld 112, 3/23/2021
Visual Examination Report from Joseph Oat Corporation for Job 2750-2, Weld 201, 3/23/2021
Visual Examination Report from Joseph Oat Corporation for Job 2750-2, Welds 205, 206, 207, 4/5/2021
Radiographs from east RDS sump tank weld 112: 0 degrees, 90 degrees
Radiographs from east RDS sump tank weld 201: 1-2, 2-3, 3-4, 4-5, 5-X
Radiographs from east RDS sump tank weld 205: 1-X
Radiographs from east RDS sump tank weld 206: 1-X
Radiographs from east RDS sump tank weld 207: 1-X
Radiographs from N2PS piping 0-N2PS-041-3/4”-032 weld 6: 0 degrees, 90 degrees
Radiographs from RDS piping 0-RDS-054-4”-101 weld 58: 0-5, 5-10, 10-0
Radiographs from RDS piping 0-RDS-054-4”-101 weld 58-1: 0-5, 5-10, 10-0
Radiographs from RDS weld FW-2 connecting PS-90061-027-01 and PS-90061-027-02: 0-5, 5-10, 10-0

Procedures (Baker)

CI-SHINE-5.01-10, Process Pipe Systems and Support Installation, Rev. 0
CI-SHINE-9.01-1, Welding Procedure Development and Qualification, Rev. 2
CI-SHINE-9.01-2, Welder and Welding Operator Performance Qualification, Rev. 2
CI-SHINE-9.01-3, Welding Electrode Control, Rev. 3
CI-SHINE-9.01-4, Welding Documentation Requirements, Rev. 1
CI-SHINE-9.01.6, ASME Welding Performance and Workmanship Standard, Rev. 1
CI-SHINE-13.01-1, Material Handling and Control, Rev. 4
NQAP SHINE-2.02, Co-worker Qualification and Certification, Rev. 2
NQAP SHINE-9.01, Controlling Special Processes, Rev. 2
NQAP SHINE-10.01, Performing Inspections, Rev. 3
NQAP SHINE-13.01, Handling, Storage, Cleaning, Packaging, and Shipping of Items, Rev. 4
NQAP SHINE-15.01, Controlling Nonconforming Items, Rev. 4
NQAP SHINE-17.01, Controlling Quality Assurance Records, Rev. 4
QAPD, Quality Assurance Program Description for the SHINE Medical Technologies Facility, Rev. 1

Procedures (SHINE)
1600-01-19, Handling, Storage, Shipping, Identification, and Control of Items, Rev. 3
2000-01-22, Inspection and Test Personnel Qualification, Rev. 1
2000-09-01, Quality Assurance Program Description (QAPD), Rev. 18
SL-2021-1003, Installation Procedure for Seismic Category I and II Auxiliary System Piping/Tubing and Supports, Rev. 0

Procurement Documents
Purchase Order PO-604056
Purchase Order PO-602750, 10/07/2021
Purchase Contract K-2020-0059-APP-004, 11/30/2021

Qualification Records
FRM 2000-01-22-01, Initial Capability Evaluation, D. Truman, 8/16/2021
FRM 2000-01-22-03, Inspection and Test Personnel Qualification Record, D. Truman, 8/16/2021
FRM 2000-01-22-05, Outside Service Provider Inspection and Test Personnel Qualification Record, R. Friscia, 2/28/2022
FRM 2000-01-23-01, Visual Acuity Examination Record for Inspection and Test Personnel, D. Truman, 8/16/2021
Form QW-484A, Suggested Format A for Welder Performance Qualifications (WPQ) for welder 5-106M
Form QW-484A, Suggested Format A for Welder Performance Qualifications (WPQ) for welder 5-129Q
Welder Qualification Test Record for welder 5-124P

Specifications
SPEC-N2PS-0002, Nitrogen Gas Piping Specification, Rev. 1
SPEC-PR-0002, Tank Specification for SHINE Radioisotope Production Facility, Rev. 1
SPEC-PR-0003, Primary and Process Piping (Various Systems), Rev. 1
SPEC-RDS-0002, RDS Embedded Piping, Rev. 3

Welding Procedure Specifications / Procedure Qualification Records
8-3-1, Welding Procedure Specification (WPS) for Gas Tungsten Arc Welding, 10/20/2021
8-T-12, Welding Procedure Specification (WPS), Rev. 0
87802, Procedure Qualification Record (PQR), 10/20/2021
87804, Procedure Qualification Record (PQR), 10/20/2021
9709-1, Procedure Qualification Record (PQR), 6/26/2002

Welding Records
9.01-5, Weld Material Request, WP-RDS-PF-DIV45-Pipe-001, 12/12/2019
9.01-5, Weld Material Request, WP-RDS-PF-DIV45-Pipe-001, 02/11/2020
9.01-5, Weld Material Request, WP-RDS-PF-DIV45-Pipe-001, 03/02/2020
9.01-9, Weld Filler Material Log, 0-N2PS-041-3/4”-032, WP-N2PS-PF-PIPING-001, 2/8/2022
9.01-9, Weld Filler Material Log, 0-RDS-011-2”-019, WP-RDS-PF-PIPING-001, 5/11/2022
9.01-9, Weld Filler Material Log, 3-TSSS-011-1/2”-001, WP-TSSS-PF-PIPING-001, 5/4/2022
9.01-9, Weld Filler Material Log, 6-TSSS-011-1/2”-001, WP-TSSS-PF-PIPING-001, 5/4/2022
9.01-9, Weld Filler Material Log, 6-TSSS-011-2”-001, WP-TSSS-PF-PIPING-001, 5/4/2022
9.01-9, Weld Filler Material Log, NCR-19-0015, 12/31/19 – 01/06/2020
9.01-11, Weld Tracking Form, 0-N2PS-041-3/4”-032, WP-N2PS-PF-PIPING-001, 3/2/2022

9.01-11, Weld Tracking Form, 0-RDS-011-2”-019, WP-RDS-PF-PIPING-001, weld 18C1, 5/11/2022
9.01-11, Weld Tracking Form, Pipe Spool RDS 054-4”-027, WP-RDS-PF-DIV45-PIPE-001, 03/15/2021
9.01-12, Weld Data Card, FW-3, PS-90061-27-02/03, 03/12/2021
9.01-12, Weld Data Card, FW-6, PS-90061-28-01, 03/12/2021
9.01-12, Weld Data Card, Weld 6, PS-90061-027-01, 02/13/2020
9.01-12, Weld Data Card, Weld 8, PS-90061-027-04, 02/13/2020
9.01-12, Weld Data Card, Weld 36, PS-90061-027-04, 02/13/2020
9.01-12, Weld Data Card, Weld 37, PS-90061-027-04, 02/13/2020
Daily Weld Report/NDE Request, 0-RDS-011-2”-019, weld 18C1, 5/11/2022
Requisition for Welding Filler Material, 1592, 5/11/2022
Requisition for Welding Filler Material, 2125, 2/8/2022
Weld Map for 0-N2PS-041-3/4”-032, N2PS-Nitrogen purge system, Piping Isometric, Rev. 0

Work Packages
WP-N2PS-PF-PIPING-001, Nitrogen Purge System
WP-PR-RPF-SPRT-001, Radioisotope Production Facility Pipe Supports
WP-RDS-PF-PIPING-002, Installation of RDS Piping Production Facility (PF)

LIST OF INSPECTION PROCEDURES USED

IP 69020	Inspection of Safety-Related Items (and Services) During Construction of Non-Power Production and Utilization Facilities
IP 69021	Inspections of Quality Assurance Program Implementation During Construction of Non-Power Production and Utilization Facilities