

Notice of Substantial Completion

Unit 3 Fire Alarms and Fault Isolators

OPG Project: 73796

ES Fox Project: 18-5200



Project Correspondence

Correspondence #: ESFL-5200-006 / NRR
Date: 18-Jul-2023
ES Fox Job Number: 19-5200
OPG Project Number: 73796
PO & Line(s): 286347
Job Title: U3 Fire Protection

Attn: Shawn Fernandes, Project Manager

This memorandum is being submitted to document that Substantial Completion has been achieved on the U3 Fire Alarm and Fault Isolator project (73796).

Included within this memo are:

1. Notice of Substantial Completion form (ES MSA Attachment 5.1a)
2. Construction Completion Declaration form (s)
3. Substantial Completion Punch List
4. Form 9 CERTIFICATE OF SUBSTANTIAL PERFORMANCE OF THE CONTRACT UNDER SECTION 32 OF THE ACT
5. AFS Reports (NK38-REP-67870-10126 & 10127)

As of July 18th, 2023, there is 0\$ pending in Oncore, and 46\$ rejected. The rejected cost will be removed in association with the attached punch list.

Total Contract Value: \$2,032,748.00

Total Oncore Actuals: \$1,325,637.61

Total EAC: \$1,325,592.61

Sincerely,

A handwritten signature in black ink, appearing to read "Sam Cudlip", is written over a horizontal line.

Sam Cudlip

Enclosure: See Above 1-5.

cc: Paolo Auciello, Amr Omar, Sunny Sahi

FORM 9

CERTIFICATE OF SUBSTANTIAL PERFORMANCE OF THE CONTRACT UNDER SECTION 32 OF THE ACT

Construction Act

Town of Bowmanville, region of Durham

(County/District/Regional Municipality/Town/City in which premises are situated)

1 Holt Rd S, Bowmanville, ON L1C 3Z8

(street address and city, town, etc., or, if there is no street address, the location of the premises)

This is to certify that the contract for the following improvement:

Darlington Refurbishment – Balance of Plant - Unit 3 Fire Alarms and Fault Isolators - Purchase Order 286347 Line 001 and 003.

(short description of the improvement)

to the above premises was substantially performed on **31-March-2022**

(date substantially performed)

Date certificate signed: **18-July-2023**

(payment certifier where there is one)

Sam Cudlip

(owner and contractor, where there is no payment certifier)

Paolo Auciello

DocuSigned by:

Manager (acting)

8/9/2023

68881427CCC542A...

OPG

Name of owner: **Ontario Power Generation**

Address for service: **1 Holt Rd S, Bowmanville, ON L1C 3Z8**

Name of contractor: **E.S. Fox Limited**

Address for service: **984 Farewell St Unit 1, Oshawa, ON L1H 6N6**

Name of payment certifier (where applicable): **N/A**

Address: **N/A**

(Use A or B, whichever is appropriate)

☐ A. Identification of premises for preservation of liens:

(if a lien attaches to the premises, a legal description of the premises, including all property identifier numbers and addresses for the premises)

☒ B. Office to which claim for lien must be given to preserve lien:

Darlington Nuclear Generating Station. 1 Holt Rd S, Bowmanville, ON L1C 3Z8. Ontario Power Generation

(if the lien does not attach to the premises, a concise description of the premises, including addresses, and the name and address of the person or body to whom the claim for lien must be given)



Available For Service (AFS) Report

OPG Proprietary	
Document Number: NK38-REP-67870-10126	
Sheet Number: N/A	Revision: R001

Title: DNGS UNIT 3 - FIFA AFS REPORT, EC 130551 AND 146207

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DNGS Unit 3 - FIFA AFS Report, EC 130551 and 146207 Unit 3

Master EC Number: 124870
Design EC Number: 130551, 146207

Reviewed by: Ajanth Jathindira 31-Mar-2022

Ajanth Jathindira Date
Project Leader
Nuclear Refurbishment,
Shutdown Layup &
Support Facilities

Prepared by:

31-Mar-2022

Paolo Auciello
Project Leader II
Nuclear Refurbishment,
Fire Protection Project

Date

Approved by:

31 Mar 2022

Shawn Fernandes Date
Manager
Nuclear Refurbishment,
Fire Protection Project

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Revision Summary

Revision Number	Affected Section	Description of Revisions
R001	All	Initial revision.
R001	Section 2.0	- Added AR numbers associated with outstanding actions.
	Section 3.0	- Added AR numbers associated with outstanding actions; - Updated work order status to Complete.
	Section 4.0	- Updated commissioning workplan status to issued; - Updated work order status to Complete.
	Section 5.0	- Updated PSL status to identify the outstanding PSL update for relay R100. - Added AR numbers associated with outstanding actions.
	Section 6.0	- Added open item for R100 PSL update.

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Executive Summary

The objective of the modification is to bring the existing fire and smoke detection system into compliance or alternate compliance with CSA N293-07 Clause 7.2.1.10.3 and Clause 7.2.1.10.2 per the Darlington Refurbishment Integrated Safety Review (ISR).

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1.0 INTRODUCTION

As part of the Darlington Refurbishment Integrated Safety Review (ISR) the Darlington Nuclear Generating Station (DNGS) Fire Alarm System (FAS) was evaluated against applicable codes and standards. The gaps below were identified and planned to be resolved under Master Engineer Change (MEC) 124870.

1.1 BackgroundGap 00541

Clause 7.2.1.10.3 of CAN/CSA N293-07 requires that the fire alarm system be capable of transferring control from the MCR display and control centre to the Secondary Control Area (SCA) display and control centre.

Gap 02070

Clause 7.2.1.10.2 of CAN/CSA N293-07 requires that each display and control centre in an SCA shall provide full display and control for all portions of the fire alarm system that are located within the area under the control of the SCA display and control centre.

- Replaces Panel 03-67870-PL0039-01 with new Chubb/Edwards interface Panels 03-67870-PL3752 and 03-67870-PL3753
- Connects the Chubb/Edwards interface Panels to the EST3 panel 03-67870-PL3610-11 and Fire Network.
- Removes old conventional Pyrotronic System 3 Smoke detectors and replaces them with new addressable Chubb/Edwards smoke detectors.
- Returns to station the Class II power from the old Pyrotronic System 3 panel
- Updates the annunciation to the MCR.

1.2 Design Change Description

- Replaces Panel 03-67870-PL0039-01 with new Chubb/Edwards interface Panels 03-67870-PL3752 and 03-67870-PL3753
- Connects the Chubb/Edwards interface Panels to the EST3 panel 03-67870-PL3610-11 and Fire Network.
- Removes old conventional Pyrotronic System 3 Smoke detectors and replaces them with new addressable Chubb/Edwards smoke detectors.
- Connects Unit 3 EST3 devices to the Unit 3 annunciation in the MCR.

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2.0 DESIGN COMPLETION ASSURANCE

Item	Document No.	Status
Engineering Change Request	23275	Actioned
Modification Outline	N-FORM-10958 – MEC 124870	Issued
Design Requirements	NK38-MDR-67870-10002 NK38-RTM-67870-00001-U3	Issued
Design Plan	NK38-DP-67870-10005	Issued
Master/Design ECs	MEC 124870 Design Engineering Change (DEC): 130551 146207	Active Active Active
Design Bills of Material (DBOMs)	NK38-BOM-67870-10088-U3	Change Paper
Spare Parts List	NK38-CORR-67870-0835813	Issued
COMS Stakeholder Declaration	NK38-REF-67870-0853741	Issued
Regulatory Approvals	Not applicable, notification only.	N/A
Manufacturer's Manual	Not applicable, existing equipment.	N/A
Design Manual	NK38-DM-67870	Change Paper
Master Equipment List (MEL) Update Ready For Launch		Ready for launch, tracked under AR 28251102 task 02
Design Reports	NK38-REP-67800-10005 NK38-REP-67870-10019 NK38-REP-67800-10007 NK38-REP-67870-10032 NK38-REP-67870-10037 NK38-REP-67870-10035 NK38-REP-67870-10100 NK38-REP-67870-10108 NK38-REP-67870-10115 NK38-REP-67870-10117 NK38-REP-67870-10118	Issued
Design Guide	Not Applicable	N/A
Design Calculations	NK38-CALC-67870-10008	Issued
Technical Specifications and TSDS	Not Applicable	N/A
Annunciation Specification Data Sheet	Not Applicable	N/A
Safety Reports	Not Applicable	N/A
On-Line Wiring Information	EC 130551	Construction reports submitted to drafting office for statusung. Tracked under AR 28251102 task 14.
Instrument Calibration Specifications (ICS)	Not Applicable.	N/A

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Item	Document No.	Status
History Docket	D-HDOC-0954363-000 (Material HDOC)	Issued Installation HDOC to be submitted. Tracked under AR 28247154 task 2 and 3.
Other	Not Applicable	N/A

3.0 INSTALLATION COMPLETION ASSURANCE

Item	Document No.	Status
Detailed Installation Instructions	NK38-WPL-67870-0749390	Workplan complete
Fabrication and Installation Package Releases (FIPRs)	CWP 5200-7002	Complete, pending HDOC submission. Tracked under AR 28247154 task 2 and 3.
Change or Rework Notification (CORN)	NCR 2021-3754-1985 NCR 2021-3715-19815	Complete
Inspection and Test Plans (ITPs)	5200-7002-E1	Complete
Installation and Test Data Report for Tie-In	Not Applicable	N/A
Master Work Order	Not Applicable	N/A
Mechanical Supplemental Work Order	Not Applicable	N/A
Electrical Supplemental Work Order	5783727 5371318 5219934	Complete
Field Initiated Changes	See Table 1, below	
Configuration Report (if applicable)	Not applicable, not EPC.	N/A
Other	Not Applicable.	N/A

Table 1: List of Field Initiated Changes

Design EC	Revision	Title/Description, including Intent	Asset Suite Status
130551	002	FICREQ01 - Do not remove MAB5 from PL5478. - Terminate isolator wires at terminal block, not at the isolator module.	Closed

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Design EC	Revision	Title/Description, including Intent	Asset Suite Status
130551	002	FICREQ02 Update the OLW to remove 3-6787-0001, -0003, -0005, -10155, 10157, 10165, 10167 as shown on NK38-DRAW-67870-10467	Closed
130551	002	FICREQ03 Bill of material updates.	Closed
130551	002	FICREQ04 Bill of material updates.	Closed
130551	002	FICREQ05 - The new internal back plate for 3-6787-JB260/PL3753 is the wrong size and does not fit the screw studs on the back of the panel. (Stud dimensions for JB260/PL3753 are 16 1/8inch x 20inch, new back plate holes are 15 1/4inch x 19 1/4inch)... - Found wire colours in the field not matching OLW for 3-67870-SE157 that goes to CAP199 cable 3-6787-6625. CAP199 and cable 3-6787-6625 will also be Abandoned in place. OLW has Blue and White wires, the field has Red and Black. (Red wire is on Term 1 B, Black wire is on Term 5 on SE157)	Cancelled
130551	002	FICREQ06 - Resolve back plate for 3-6787-JB260/PL3753 - Resolve as found wire colours in the field not matching OLW	Closed
130551	002	MINORFIC01 Bill of materials update	Closed
130551	002	MINORFIC02 Bill of materials update	Closed

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Design EC	Revision	Title/Description, including Intent	Asset Suite Status
130551	003	FICREQ07 and FICREQ08 Internal wiring on PL3610 does not match design documents, polarity is reversed. Update wiring to match field condition.	Closed
130551	003	FICREQ09 Update missing drawing.	Closed
146207	002	MINORFIC01 Update software to implement required editorial changes to device messages.	Closed

4.0 COMMISSIONING COMPLETION ASSURANCE

Item	Document No.	Status
Detailed Commissioning Specification and Design Acceptance	NK38-DCS-67870-10006	Issued
Detailed Commissioning Instructions	NK38-WPL-67870-0918281	Issued
Commissioning Report and Design Acceptance	NK38-CR-67870-10012	Issued
Post-Maintenance Tests	No applicable	N/A
Commissioning Work Order Status	5219934	Complete
Other	Not applicable.	N/A

5.0 OPERABILITY AND MAINTAINABILITY

Item	Document No.	Status
Operating Manual	NK38-OM-67870-04.03 NK38-OM-67870-04.05	Issued
Impairments Manuals	Not applicable	N/A
Abnormal Incidents Manuals	Not applicable	N/A
Operator Rounds Sheets	Not applicable	N/A
Alarm Response Manual	Not applicable	N/A
Operating Procedures	Not applicable	N/A

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Item	Document No.		Status
Chemistry Laboratory Procedures	Not applicable		N/A
Power Supply List Updates	PSL Program		Per AFS walkdown, PSL update required for the new relay 3-67870-R100. Tracked under AR 28251102 task 17
Air Supply List Updates	Not applicable		N/A
Lube List Updates	Not applicable		N/A
Operational Flowsheets	NK38-FEX-67870-0501 NK38-FEX-67870-0507		TCR-FAR Will be revised to next revision incorporating changes from other ECs by June 1st, 2022. AR 28251102 task 13
Test Procedures	Not applicable		N/A
Maintenance Procedures	NK38-CMP-67870-05 NK38-CMP-78000-09 NK38-CMP-67870-07		NK38-CMP-67870-05 and NK38-CMP-78000-09 are issued. NK38-CMP-67870-07 is being updated with a number of other changes. TCD April 6, 2022. AR 28251102 task 5
Maintenance Pre-Defines NOTE: PM changes must be requested, accepted, and for frequencies less than 13 weeks, must also be created and scheduled.	PMID-RQs to be Cancelled	Equipment Number	<ul style="list-style-type: none"> PM Change Requests (CRs) Created and Submitted Work Request(s) have been raised to identify the routine PMs required post AFS
		3-67870-PL0039-11	PM CR2021-00438 cancelled existing 3-67870-PL0039 PM.
Equipment Tags Hung on Field Equipment	Complete		Verified per CCD Walkdown and photos.
Temporary Change Records	DA0050611 DA0050610 DA0050406 DA0050229 DA0050182		Terminated
Corrective Maintenance Backlog	Work Order(s) to be Cancelled		
	Not applicable		N/A
System Surveillance Program	Not applicable		N/A
Training (Operations, Maintenance, Chemistry)	Not applicable		N/A
Service Contracts	Not applicable		N/A
On-Line Wiring Status	EC 130551		Field reports submitted to be status. Tracked under AR 28251102 task 14
Spare Parts on Site	Not applicable, existing devices.		N/A
Design EC and Field Changes Incorporated into Final Drawings	EC 130551		Incorporated into change papers.
EQ Completion Assurance	Not applicable.		N/A

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Item	Document No.	Status
Other	Not applicable.	N/A

6.0 OPEN ITEMS/OUTSTANDING ACTIONS

Item	Action	A/R Ref No.	Description	TCD	Responsibility
1	Upload CWP HDOCS in VenDM	28247154	Vendor to upload construction HDOCS into VenDM	03-May-2022	ES FOX
2	Accept HDOCS in VenDM	28247154	OPG accept HDOCS and issue in records.	02-Jun-2022	NR Shutdown Layup
3	Issue flowsheets	28251102	Issue updated flowsheets NK38-FEX-67870-0501 and 0507.	01-Jun-2022	NR Plant Status
4	Issue revised CMP	28251102	Issue revised NK38-CMP-67870-07.	06-Apr-2022	NR TPAR
5	Status OLW	28251102	Status OLW for EC 130551.	15-Apr-2022	NR Drafting Office
6	Updated PSL	28251102	Updated PSL for 3-67870-R100.	10-Jun-2022	NR Shutdown Layup

7.0 POST MODIFICATION/REVIEW

Installation work plan and inspection and test plan were completed and signed off by all involved parties. The following outlines lessons learned during the project to provide OPEX to future projects.

7.1 Lessons Learned

Item	Issue Description	Corrective Action
1	Constrained resources utilized to execute work on critical path activities.	Minimize the use of resources that are constrained if it is possible to assign other resources to the work.
2	Lack of detail in schedule resulted in mobilizing resources to complete activities when the predecessor activity wasn't complete.	Ensure level 3 activities, at a minimum, contain discrete tasks when two or more work groups have interfacing activities.
3	Late identification of PC1 requirement.	Review work protection requirements at T-13 and submit required work protection applications.

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Item	Issue Description	Corrective Action
4	Change in execution strategy resulted in separating installation from commissioning activities. What was previously included in a single workplan was now documented in 2 workplans and some activities did not line up.	Apply same amount of rigour to the replication work when the workplan strategy changes.

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Appendix A: SCR Summary

SCR Number	Category	Status	Titles and Description	Actions Taken/Comments
N-2021-16765	D4	Complete	DNRU3 - Challenge to Maintenance: Delay to scheduled project work. Scheduled work unable to proceed until the 3rd shift of the week (Thursday) due to CCD not complete for fire alarm upgrade project work under WO#5371318-22,40,41,42,43 for panels 0-67870-PL5474-01, 0-67870-PL5478-01, 3-67870-PL3610-11.	P6 level tasks did not contain sufficient detail to manage the interface with support workgroup.
N-2021-16768	D4	Complete	DNRU3 - Challenge to Maintenance: Work Authorization delays WO#5371318-22/40 panel 0-67870-PL5474-01/0-67870-PL5478-01. Work delay 6 hours x 3 techs due to late work authorization.	No action taken. The que was longer than the work authorization team could manage and thus the crew had to wait.
N-2021-16914	D4	Complete	DNRU3: Project 10-73796: Undocumented Jumper in Fire Panel 3-67870-PL3610-11. Field staff walkdown upcoming cable termination tasks in work order 5371318 and discovered the panel 3-67870-PL3610-11 TB2 terminals 12, 13, 112 and 113 had wires terminated in them already. These wires were not documented in OLW nor NK38-DRAW-67870-10264. The modification (130551) requires the use of these terminals. By visually tracing the cables, it was determined the terminals were jumpered together (in and out for Loop 5).	Could have been identified earlier during detailed design walkdown. More attention to detail required during design stage.
N-2021-17975	C3	Complete	DNRU3 FIFA (Fire Isolator/Fire Alarm) Project 73195 Fire & Smoke Project - Software issues identified during installation and commissioning During the installation and commissioning of Unit 3 Fire Isolator / Fire Alarm Project 73195, it was identified that the Addressable Module SIGA-MAB #5 in Panel PL5478 was programmed in the software (SDU file) as being on Loop 3 (original configuration); but the hardware was modified to rewire it to Loop 5.	This is a discrepancy resolved by revising the Configuration Implementation Specification (CIS) document and releasing a new software patch under Software Design EC 146207 followed by updating the software in the field. This is a Human Performance-related error with lack of attention to detail.

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SCR Number	Category	Status	Titles and Description	Actions Taken/Comments
N-2021-18058	CO3	Complete	<p>DNRU3 – Fire Protection Major Mods 73796 – Unplanned 120V power source identified in PL1220-01 during “Test Before Touch Process”</p> <p>During execution of U3 Fire Alarm commissioning activities: PPT DA0023247 was obtained and three (3) electrical feed supply's to HVAC panel 3-67394-PL1220-01, as per the Load Verification, were de-energized. The panel was opened with required PPE and workers commenced voltage checks at all terminals. During the checks, a 120 VAC was found on the bottom terminal strip within the panel. Workers backed out immediately and closed panel.</p>	See N-2021-18051
N-2021-18051	C3	Approved	<p>DNRU3 - Challenge to Maintenance - 120V Power not Identified during Load Verification</p> <p>Crew was assigned to perform load verifications in fire alarm panel 3-67394-PL1220-01 with multiple 120v feeds and signals coming in from several other locations under WOT 5371318-46. Drawings were reviewed to determine power source locations, supervisor obtained WA and appropriate fuses were pulled to confirm supplies. PSL was updated accordingly. Downstream work put panel under PPT and discovered 120v power remaining.</p>	<p>Crew learning was performed and Corrective Action Plan implemented.</p> <p>Load verification was rescheduled to support project work.</p>
N-2021-18597	D4	Complete	<p>DNRU3 - Fire Protection Major Mods 73796 – Fire Alarm commissioning schedule delay due to loss of subcontractor resource.</p> <p>As part of the U3 Fire alarm commissioning activities, third party verifier (Subcontractor) is required to verify the testing of new Fire Alarm devices. During the shift, it was discovered the scheduled resource from the subcontractor was unable to support commissioning activities as scheduled. Resource entered station at approximately 09:30 and exited at 12:00. No commissioning work could progress.</p>	The project acquired a new resource. Project critical path schedule was impacted.

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SCR Number	Category	Status	Titles and Description	Actions Taken/Comments
N-2021-19849	D4	Complete	DN RU3 - Project 73796 Schedule Delay Work order 05371318 task 46 was on the T-0 plan. The crew supporting the work was overscheduled this week. Due to priority, BUB3 and Fire Panel maintenance activities took priority.	Loss of resources due to higher priority work.
N-2022-03874	C3	EO	DN RU3 - Fire Trouble Alarm CRT and window Re-flash on U0 MCR Was Found Missing (Project 10-73796) During U3 Fire Alarm Upgrade project commissioning, it was discovered that the fire trouble alarm "re-flash" function associated with AN5731 was missed in the Design. from the programming.	Correction plan being prepared. Installation matches design. New design required to resolve the issue. May be able to address the issue during Unit 4 execution.



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OPG Proprietary	
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DNGS Unit 3 - FIFA AFS Report, EC 133541 Unit 3

Master EC Number: 126981
Design EC Number: 133541

Reviewed by: Ajanth Jathindira 31-Mar-2022

Ajanth Jathindira Date
Project Leader
Nuclear Refurbishment,
Shutdown Layup &
Support Facilities

Prepared by:

31-Mar-2022

Paolo Auciello Date
Project Leader II
Nuclear Refurbishment,
Fire Protection Project

Approved by:

Mar 31st 2022

Shawn Fernandes Date
Manager
Nuclear Refurbishment,
Fire Protection Project

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DNGS UNIT 3 - FIFA AFS REPORT, EC 133541**Revision Summary**

Revision Number	Affected Section	Description of Revisions
R000	All	Initial revision.
R001	Section 2.0	<ul style="list-style-type: none"> - Added RTM document number to the design requirements; - Added reference to SCR N-2022-04496; - Corrected Online Wiring status; - Added AR numbers associated with outstanding actions.
	Section 3.0	<ul style="list-style-type: none"> - Updated work order status to "Complete".
	Section 4.0	<ul style="list-style-type: none"> - Updated commissioning workplan status to "Issued"; - Updated work order status to "Complete".
	Section 5.0	<ul style="list-style-type: none"> - Updated operating manual status to N/A; - Corrected online wiring status.
	Section 6.0	<ul style="list-style-type: none"> - Added reference to online wiring action.
	Section 7.1	<ul style="list-style-type: none"> - Described incorporation of lesson's learned from previous Unit.

Available For Service (AFS) Report

OPG Proprietary		
Document Number: NK38-REP-67870-10127		
Sheet Number: N/A	Revision: R001	Page: 4 of 10
Title: DNGS UNIT 3 - FIFA AFS REPORT, EC 133541		

Executive Summary

The objective of this modification is to install 8 isolator modules on the Darlington Nuclear Generating Station (DNGS) Fire Alarm System (FAS). The modules were installed in stairwells R3-03 and R3-04. The modification brought Unit 3 in compliance with CAN/ULC S524-06 clauses 4.2.10, 5.14.2, and NBCC clause 3.2.4.9.

Available For Service (AFS) Report

OPG Proprietary		
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Title:
DNGS UNIT 3 - FIFA AFS REPORT, EC 133541

1.0 INTRODUCTION

As part of the Darlington Refurbishment Integrated Safety Review (ISR) the Darlington Nuclear Generating Station (DNGS) Fire Alarm System (FAS) was evaluated against applicable codes and standards. The gaps below were identified and planned to be resolved under Master Engineer Change (MEC) 133541.

1.1 BackgroundGap 00533

CAN/ULC S524-06 clauses 4.2.10, 5.14.2, and NBCC clause 3.2.4.9 define requirements for isolation modules. Site inspections and documentation review have determined several stairwell fire zone boundaries were crossed and additional isolators are required.

1.2 Design Change Description

Install 8 isolator modules in the reactor building stairwells R3-03 and R3-04 to meet code requirements.

2.0 DESIGN COMPLETION ASSURANCE

Item	Document No.	Status
Engineering Change Request	23353	Actioned
Modification Outline	N-FORM-10958 – MEC 126981	Issued
Design Requirements	NK38-MDR-67870-10003 NK38-RTM-67870-00001-U3	Issued
Design Plan	NK38-DP-67870-10006	Issued
Master/Design ECs	MEC 126981 Design Engineering Change (DEC): 133541	Active Active
Design Bills of Material (DBOMs)	NK38-BOM-67870-10090-U3	Change Paper
Spare Parts List	Not applicable, existing equipment.	N/A

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Item	Document No.	Status
COMS Stakeholder Declaration	MOD-126981, preliminary COMS only.	Preliminary COMS form signed and found in MEC bookmark. Final COMS sign off for Unit 2 was found in MEC bookmark. Final COMS form was not found for Units 3, 1 and 4. Meeting invite and COMS presentation was found for a final COMS conducted in 2016. It appears the resources at the time did not file the final COMS form in AS7. The issue has been documented in N-2022-04496. Documented finding on turnover declaration.
Regulatory Approvals	Not applicable, notification only.	N/A
Manufacturer's Manual	Not applicable, existing equipment.	N/A
Design Manual	Not applicable, no impact on design manual.	N/A
Master Equipment List (MEL) Update Ready For Launch		Ready for launch, tracked under AR 28251104 task 02
Design Reports	NK38-REP-78000-10064 NK38-REP-78000-10068 NK38-REP-67870-10044	Issued
Design Guide	Not Applicable	N/A
Design Calculations	Not Applicable	N/A
Technical Specifications and TSDS	Not Applicable	N/A
Annunciation Specification Data Sheet	Not Applicable	N/A
Safety Reports	Not Applicable	N/A
On-Line Wiring Information	EC 133541	Construction reports submitted to drafting office for status. Tracked under AR 28251104 task 14.
Instrument Calibration Specifications (ICS)	Not Applicable.	N/A
History Docket	D-HDOC-0954364-000 (Material HDOC)	Issued Installation HDOC to be submitted. Tracked under AR 28247154 task 2 and 3.
Other	Not Applicable	N/A

Available For Service (AFS) Report

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3.0 INSTALLATION COMPLETION ASSURANCE

Item	Document No.	Status
Detailed Installation Instructions	NK38-WPL-67870-0749389	Workplan complete
Fabrication and Installation Package Releases (FIPRs)	CWP 5200-7001	Complete, pending HDOC submission. Tracked under AR 28247154 task 2 and 3.
Change or Rework Notification (CORN)	Not applicable.	N/A
Inspection and Test Plans (ITPs)	5200-7001-E1	Complete
Installation and Test Data Report for Tie-In	Not Applicable	N/A
Master Work Order	Not Applicable	N/A
Mechanical Supplemental Work Order	Not Applicable	N/A
Electrical Supplemental Work Order	5218674	Complete
Field Initiated Changes	See Table 1, below	
Configuration Report (if applicable)	Not applicable, not EPC.	N/A
Other	Not Applicable.	N/A

Table 1: List of Field Initiated Changes

Design EC	Revision	Title/Description, including Intent	Asset Suite Status
133541	000	FICREQ01 Bill of material updates.	Closed
133541	000	FICREQ02 Bill of material updates.	Closed

4.0 COMMISSIONING COMPLETION ASSURANCE

Item	Document No.	Status
Detailed Commissioning Specification and Design Acceptance	NK38-DCS-67870-10007	Issued
Detailed Commissioning Instructions	NK38-WPL-67870-0918281	Issued
Commissioning Report and Design Acceptance	NK38-CR-67870-10011	Issued
Post-Maintenance Tests	No applicable	N/A
Commissioning Work Order Status	5219934	Complete
Other	Not applicable.	N/A

Available For Service (AFS) Report

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5.0 OPERABILITY AND MAINTAINABILITY

Item	Document No.		Status
Operating Manual	Not applicable		N/A
Impairments Manuals	Not applicable		N/A
Abnormal Incidents Manuals	Not applicable		N/A
Operator Rounds Sheets	Not applicable		N/A
Alarm Response Manual	Not applicable		N/A
Operating Procedures	Not applicable		N/A
Chemistry Laboratory Procedures	Not applicable		N/A
Power Supply List Updates	Not applicable		N/A
Air Supply List Updates	Not applicable		N/A
Lube List Updates	Not applicable		N/A
Operational Flowsheets	Not applicable.		N/A
Test Procedures	Not applicable		N/A
Maintenance Procedures	Not applicable.		N/A
Maintenance Pre-Defines NOTE: PM changes must be requested, accepted, and for frequencies less than 13 weeks, must also be created and scheduled.	PMID-RQs to be Cancelled	Equipment Number	<ul style="list-style-type: none"> PM Change Requests (CRs) Created and Submitted Work Request(s) have been raised to identify the routine PMs required post AFS
	Not applicable	N/A	N/A
Equipment Tags Hung on Field Equipment	Complete		Verified per CCD Walkdown and photos.
Temporary Change Records	Not applicable.		N/A
Corrective Maintenance Backlog	Work Order(s) to be Cancelled		
	Not applicable		N/A
System Surveillance Program	Not applicable		N/A
Training (Operations, Maintenance, Chemistry)	Not applicable		N/A
Service Contracts	Not applicable		N/A
On-Line Wiring Status	EC 133541		Construction reports submitted to drafting office for statusung. Tracked under AR 28251104 task 14.
Spare Parts on Site	Not applicable, existing devices.		N/A
Design EC and Field Changes Incorporated into Final Drawings	EC 133541		Incorporated into change papers.
EQ Completion Assurance	Not applicable.		N/A
Other	Not applicable.		N/A

Available For Service (AFS) Report

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6.0 OPEN ITEMS/OUTSTANDING ACTIONS

Item	Action	A/R Ref No.	Description	TCD	Responsibility
1	Upload CWP HDOCS in VenDM	28247154	Vendor to upload construction HDOCS into VenDM	03-May-2022	ES FOX
2	Accept HDOCS in VenDM	28247154	OPG accept HDOCS and issue in records.	02-Jun-2022	NR Shutdown Layup
3	Status Online Wiring	28251104	Status Online Wiring for EC 133541.	15-Apr-2022	NR Drawing Office.

7.0 POST MODIFICATION/REVIEW

Installation work plan and inspection and test plan were completed and signed off by all involved parties. The following outlines lessons learned during the project to provide OPEX to future projects.

7.1 Lessons Learned

Item	Issue Description	Corrective Action
1	Unit 0, 2 OPEX – Scaffold was being constructed at the same time as installation activities. As a result if scaffold was behind schedule, electrical crew was delayed.	Unit 3 incorporated this OPEX and treated scaffold as a pre-requisite. Scaffold erection started well in advance of the projects start of installation milestone.
2	Unit 0, 2 OPEX – Fire Isolators and Fire Detector modifications were executed separately. There is a opportunity to gain efficiencies by executing these similar modifications concurrently.	Unit 3 exploited the opportunity. Fire Isolator Design EC 133541 was executed concurrently with Fire Detector EC 130551; resulting in significant cost savings.

Available For Service (AFS) Report

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Appendix A: SCR Summary

None



Construction Completion Declaration

SECTION A: GENERAL INFORMATION

Facility: DNGS	Unit: 3
CCD Package Title: Unit 3 Fire and Smoke Detection System Upgrades CCD Package	
CCD Package No. NK38-CCD-67870-0961395	
CCD P6 Milestone: 73796A5110, 73796A5345x.	
Turnover Plan Reference: NK38-CORR-09701-0879428	
Master EC Number: 124870 / 126981 Rev.: 001 / 003	
Design EC Number(s): 130551, 133541, 146207 Rev.(s): 003 / 002/000	
Description of work completed: Installed new isolator modules to protect the fire and smoke detection system equipment in stairwell R3-03 and R3-04 from the effects of localized damage. The new isolator modules will isolate a fault in communication line so the other sections will continue to operate as required. Remove Pyrotronics fire panel 3-67870-PL0039-1 and tie the associated loops in the EST3 panel PL3610 (after CCD). Replaced analog detectors with new digital detectors.	
Was approval given to classify the CCD as Non-Critical? Yes: <input type="checkbox"/> No: <input checked="" type="checkbox"/> With concurrence obtained from RTS Engineering Manager, signatures are not required in Sections (F), (G) (I) or (J) as MTL ensures stakeholder functions are complete and Project Manager accepts the CCD.	

SECTION B: Declaration Boundaries

For the purpose of this Construction Completion Declaration the boundary is described as the following: Installed new isolator modules to protect the fire and smoke detection system equipment in stairwell R3-03 and R3-04 from the effects of localized damage. The new isolator modules will isolate a fault in communication line so the other sections will continue to operate as required. Completed via installation workplan: NK38-WPL-67870-0749389 WOs: 5218674 & 5219869 Remove Pyrotronics fire panel 3-67870-PL0039-1 and tie the associated loops in the EST3 panel PL3610 (after CCD). Replaced analog detectors with new digital detectors. Completed via installation workplan: NK38-WPL-67870-0749390 WOs: 5219934 & 5371318
--

SECTION C: Executing Organization Declaration Checklist (Applicable to all CCDs)

1. Work bounded by the CCD is complete in the field
2. Walkdown complete
3. CCD documentation **complete and provided to stakeholders for review** ☒ and
CCD documentation issued in Asset Suite 7 ☐ or pending issue identified as an "Open Item" ☒
4. CCD Package (N-FORM-11527) prepared
5. "Open Items" identified and dispositions accepted by stakeholders. Open item milestones are correctly identified and tied in the project schedule.

Paul Csermely

Declaration by:

Executing Organization

27OCT21

Date

SECTION D: Design Team Leader Review Checklist (Applicable to Modification CCDs)

1. Walkdown complete
2. Field Initiated Changes have been reviewed, approved, implemented in the field and incorporated in an approved Design EC revision. If an EC revision has not occurred, the DTL must state in writing that energization can continue prior to incorporation of FICs (as per N-PROC-MP-0090, Appendix E). I concur that energization may proceed prior to incorporation of FIC's _____ (Initial here, if applicable)
3. Non-conformances are acceptable and have been closed or dispositioned.

4. Station Material Condition and Housekeeping requirements (as per N-STD-MA-0008) acceptable
5. Confirmed that all Cat IDs set to ready.
6. Configuration Report accepted and in AS7 (if required)
7. Issue Tracking File items reviewed and all applicable items have been addressed and closed.
8. Design "Open Items" reviewed and dispositions accepted

Muhammad Rashid



Oct 27, 2021

Reviewed by:

Date

Design Team Leader

SECTION E: Project Engineer (for non-Modification CCDs) / Modification Team Leader (for Modification CCDs) Review Checklist (Section is applicable to all CCDs)

1. Work bounded by Contractor's CCD is complete in the field
2. Walkdown complete
3. Station Material Condition and Housekeeping requirements (as per N-STD-MA-0008) acceptable
4. CCD documentation received, reviewed for completeness, and issued in Asset Suite 7 or pending issue identified as an "Open Item"
5. Issue Tracking File items reviewed and all applicable items have been addressed and closed.
6. CCD Package (N-FORM-11527) reviewed for completeness and quality
7. Confirm "Open Items" reviewed and accepted by stakeholders and documented in Asset Suite 7. Confirm Open item milestones are correctly identified and tied in the project schedule.
8. IF Graded Approach for non-critical work applied, Adverse Conditions reviewed and dispositions acceptable

MTL shall be qualified in Qual 42294 if MTL is from contractor organization, or linked to Qual 42293 if MTL is from OPG.

Paolo Auciello/Andrew Keenleyside

27-OCT-2021

Reviewed by (for Modification CCDs)

Date

Modification Team Leader

N/A

Reviewed by (for non-modification CCDs)

Date

Or Co-signed by OPG Project Engineer
(for Modification CCDs where the MTL is from the
contractor organization)

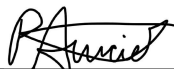
Or Not Applicable if signed by OPG MTL

SECTION F: System Engineer Review Checklist (Applicable to all CCDs, except non-critical)

1. Work bounded by CCD is complete in the field
2. Walkdown complete
3. Station Material Condition and Housekeeping requirements (as per N-STD-MA-0008) acceptable
4. CCD documentation received, reviewed for completeness, and issued in Asset Suite 7 or pending issue identified as an "Open Item"
5. CCD Package (N-FORM-11527) reviewed for completeness and quality
6. Adverse Conditions reviewed and dispositions acceptable
7. "Open Items" reviewed and acceptable

Paolo Auciello for
as per phone
conversation

Gary Gan



27-OCT-2021

Reviewed by:

Date

System Engineer

SECTION G: Component Engineer Review Checklist (Applicable to all CCDs, except non-critical, if required)

1. Work bounded by CCD is complete in the field
2. Walkdown complete
3. Station Material Condition and Housekeeping requirements (as per N-STD-MA-0008) acceptable
4. CCD documentation received, reviewed for completeness, and issued in Asset Suite 7 or pending issue identified as an "Open Item"
5. CCD Package (N-FORM-11527) reviewed for completeness and quality
6. Adverse conditions reviewed and dispositions acceptable (fitness for service assessment or post-maintenance test)
7. "Open Items" reviewed and acceptable

8. Equipment meets fitness for service program requirements (N-PROG-MA-0017)

N/A

Reviewed by:
Component Engineer

Date

SECTION H: Project Manager/Director Recommendation Checklist (Applicable to all CCDs)

1. Project review of work completed in the field and documentation for CCD complete.
2. Status of "Open Items" is acceptable
3. IF Graded Approach for non-critical work Project Manager Accepts CCD.

Shawn Fernandes



Oct 27th 2021

Recommended by (for standard CCDs):

Date

Or Accepted by (for Non-Critical CCDs):
Project Manager

SECTION I: Refurbishment Interface and RTS Engineering Manager Recommendation Checklist (Applicable to all CCDs, except non-critical)

1. Engineering review of CCD complete
2. Status of "Open Items" is acceptable

Alana Osmond for S. Goodchild



28OCT2021

Recommended by:

Date

Refurbishment Interface and RTS Manager

SECTION J: Operations Manager Acceptance Checklist (Applicable to all CCDs, except non-critical)

1. Status of work in the field and associated documentation is acceptable
2. Status of "Open Items" is acceptable

Andrew Robertson

Lorne Shantz for



2021/10/28

Accepted by:

Date

Operations Manager

Attachment 5.1(a) – Notice of Substantial Completion Form**NOTICE OF SUBSTANTIAL COMPLETION**

To: Ontario Power Generation Inc.	Contract: Darlington Refurbishment – Balance of Plant - Unit 3 Fire Alarms and Fault Isolators)
	Contract No.: PO 286347 Line 001/003
	Date: 18-July-2023

Defined terms used in this Notice have the same meanings given to those terms in the Contract. In accordance with section 5.1(a) of Appendix 8 to the ES MSA included in the Contract, the Contractor hereby gives OPG notice that Substantial Completion has occurred as follows:

Date of “substantial performance” under the Construction Lien Act (Ontario)	31- March-2022 <i>U3 FIFA – AFS Completed</i>
Grounds for Requesting Substantial Completion	All requirements per WS-BH-2018-1151 Section 12.1 made in accordance with ES MSA. CCD and AFS Complete.
Costs to Finish the Services	\$0.00
Delivery of Approvals	Final approvals were delivered on June 7 th , 2022 upon closure of AR 28247154 (associated with NK38-CCD-67870-0961395)
Delivery of Reports	NK38-CCD-67870-0961395 was accepted on October 28 th , 2021, and AFS was completed March 31 st , 2022.
Independent Professional Certificate	Not Applicable

E.S. Fox Limited

9127 Montrose Road, Niagara Falls
ON L2E 7J9

By: _____

Name:

Title:

Project Number: 73796

[illegible]