

NSTX-U Recovery Project Risk Register 03092020 (Open Risks)

ID	Type	Risk Description	Score	...at this time...	...then there will be this technical consequence	...which impacts the Project in this way.	Probability	Cost Impact (\$M)	Schedule Impact (Months)	Expected Monetary Value- EMV (\$M)	Risk Handling Approach	Mitigation Plan/Comments	Mitigated EMV	Risk Retirement Target Date	Status (OPEN or RETIRED)	LEVEL
1	Threat	If additional scope is added to the project	63	THROUGHOUT PROJECT	then additional or diversion of project resources will be required to support extended scope completion	will impact project costs and schedule and may halt ongoing efforts to complete the project	75%	3.50	7.0	2.63	Accept	No definitive reduction in probability / None	2.63	PSS FDR completion	OPEN	I
276	Threat	If first plasma is not achieved until the late finish	63	COMMISSIONING	then Standing Army will be required to support extended scope completion	Schedule and Cost impact	75%	5.50	0.0	4.13	Accept	No definitive reduction in probability / None	4.13	End of project	OPEN	I
8	Threat	If there is a failure of support system or component (critical computer -DCPS, PCS, MDS+, EPICS, HCS component)	40	COMMISSIONING	then there will be a delay in the commissioning until restoration of the component	Schedule and Cost impact	50%	2.00	1.0	1.00	Control	Perform maintenance and pre-op test to ensure functionality with M&RP funds \$\$\$; Perform maintenance and pre-op test to ensure functionality with M&RP funds \$\$\$ (Budgeted in LOE Job 1150 OPER X105 Activity OPER-1240, -1500)	0.50	completion of commissioning	OPEN	I
12	Threat	If the project has continuing Resolution/ Funding Issues	36	THROUGHOUT PROJECT	Then execution of spending plan may be affected	Schedule and Cost impact	15%	3.00	3.0	0.45	Accept	No definitive reduction in probability / None	0.45	Project Completion	OPEN	I
32	Threat	If there is CSC Distortion due to continuous welds or the the HTT clamps	35	SUBASSEMBLY COMPLETION	Then the casing will warp and may not fit TFOH bundle	Schedule and Cost impact	50%	1.00	6.0	0.50	Control	Manufacture new ISDV with thicker wall to allow for post machining after tube and clamp installation. Installing heat sinks to minimize distortion.: Perform testing to estimate potential impact. Perform mockup of bellows/divertor flange to assess effects of welds and refine techniques to minimize distortion (BCP-081 address this risk)	0.10	End of fabrication for CSC	OPEN	I
284	Threat	General reassembly issues (risk rollup), missing parts, equipment problems, etc.	35	MACHINE ASSEMBLY	General technical	Cost and schedule Impact	70%	0.50	1.0	0.35	Accept	No definitive reduction in probability	0.35	Machine reassembly	OPEN	I
283	Threat	If the outboard divertor clevis attachments cannot be qualified for GRD loads	32	DESIGN	then clevis attachments will have to me modified	Cost and schedule Impact	15%	2.00	2.0	0.30	Accept	No definitive reduction in probability	0.30	Project FDR	OPEN	II
6	Threat	If there is a delay with delivery of vendor fabricated components or other components	30	PROCUREMENT	Then there will be delays in starting fabrication/assembly time	Schedule and Cost impact, cost increased cost if expedited	50%	0.50	6.0	0.25	Accept	No definitive reduction in probability / Ensure contracts assure this potential is addressed and award contract as soon as possible, provide oversight at the vendor to ensure schedules are being adhered to. Maintaining strong vendor interface/communication and tracking, in most cases personnel will be at fabrication facilities	0.25	Completion of PFCs	OPEN	II
44	Threat	If the pedestal fails the structural design criteria	30	DESIGN	then redesign and analyses pedestal is required	schedule delay	30%	0.20	6.0	0.06	Accept	No definitive reduction in probability	0.06	FDR for MCS	OPEN	II
95	Threat	If an unanticipated event at a vendor that delays fabrication	30	FABRICATION	then a schedule delay may be encountered for the assembly	Schedule and Cost impact	50%	0.50	6.0	0.25	Accept	No definitive reduction in probability / None	0.25	End of reassembly	OPEN	II
5	Threat	If requirements and conduct of operations prescribed by the new QAPD, Recovery QA Plan and other Extent of Cause corrective actions are not correctly integrated in to Recovery project planning	28	THROUGHOUT PROJECT	then work could be done incorrectly or inefficiently	Schedule and Cost impact	20%	1.50	4.5	0.30	Accept	None / Implement actions from this in parallel with project activities to limit impact. Engage engineering and QA organizations to look ahead for impacts and develop plans to mitigate that impact. Assessments will be utilized to ensure inclusion is appropriate and completed.	0.30	Project Completion	OPEN	II
14	Threat	If the OPA reviews (CDE-3b) are significantly delayed compared to present assumptions	28	PROCUREMENT	then the start of fabrication of key components will be delayed	Schedule and Cost impact	12%	1.00	1.0	0.12	Accept	Realized CDE-2/3A portion.	0.12	FDR completion	OPEN	II
93	Threat	If realignment of outer PF coil causes damage to the coil	28	SUBASSEMBLY COMPLETION	then the Outer PFs will have to be replaced	Schedule and cost impact	25%	1.00	6.0	0.25	Accept	No definitive reduction in probability / Define/fabricate lifting fixtures for use during installation	0.25	Completion of installation	OPEN	II
49	Threat	If more than one Rogowski sensors is damaged	27	MACHINE ASSEMBLY	the machine will has to be taken apart and the rogowskis repaired	Schedule and Cost impact	10%	3.00	6.0	0.30	Accept	No definitive reduction in probability / Pre-job briefings, performance of careful work during installation to minimize the risk of rogowski damage , installation of multiple extra rogowskis	0.30	End of assembly	OPEN	II
56	Threat	If there is a Major Event - safety related accident at the project	27	THROUGHOUT PROJECT	then there will be a stand down of work activities	Schedule and Cost impact	10%	3.00	2.0	0.30	Accept	No definitive reduction in probability / None	0.30	Project Completion	OPEN	II
64	Threat	If a major issue arises with the MG set (or field supply, rheostat, etc.) during the ISTP	27	COMMISSIONING	then the MG will need repaired	Schedule and Cost impact	10%	1.00	12.0	0.10	Control	Perform maintenance and periodic runs to ensure operability under M&RP (Budgeted in LOE Job 1150 OPER X105 Activity OPER-1240, -1500)	0.05	Commissioning	OPEN	II

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66	Threat	If any magnet within the CS assembly fails hi-pot after CS installation in NSTX vessel due to an installation issue	27	MACHINE ASSEMBLY	then disassembly to assess and repair the issue/failure is required	Cost and schedule impact. Potential component rework and repeat of critical steps.	10%	1.50	12.0	0.15	Accept	No definitive reduction in probability / Pre-job briefing to ensure minimization of potential damage and then multiple verifications during assembly including megger tests after risk-bearing steps	0.15	End of assembly	OPEN	II
13	Threat	If the modifications to the passive plate supports make plate installations more challenging	25	MACHINE ASSEMBLY	the technicians will spend more time than presently allocated on the installation	Schedule and Cost impact	50%	0.30	1.0	0.15	Accept	No definitive reduction in probability / Develop interface documentation and design integration early in PDR phase to ascertain maximize margins and perform prototyping early with in field inspections	0.15	Completion of assembly	OPEN	II
19	Threat	If vendor bids exceed assumed estimates for services/goods provided	25	PROCUREMENT	then the cost of the project will increase	Schedule and Cost impact	50%	0.50	0.0	0.25	Accept	No definitive reduction in probability / interact with vendors, conduct market research	0.25	end of procurement	OPEN	II
36	Threat	If there is a lack of manpower resource (technicians, QA, HP) with specific skill set during critical evolutions	25	THROUGHOUT PROJECT	then work could be done incorrectly or inefficiently	Cost and Schedule impact. Delays critical path progress	50%	0.00	4.0	0.00	Control	Pilot plan in place to bring in 4 techs to test process / Subcontract scopes which lend themselves to turnkey contracts. Establish BOAs with firms to augment staff. Dedicated HR liaison added to improve hiring process (Budgeted under PM LOE 9000 job)	0.00	Commissioning	OPEN	II
87	Threat	If interference with existing interfaces (bus work, etc.) is discovered during installation	25	SUBASSEMBLY COMPLETION	then rework and/or retrofit existing or new components will be required	Schedule and Cost impact	50%	0.50	2.0	0.25	Accept	No definitive reduction in probability / Review in interface and integration meetings to identify and resolve all interferences	0.10	Post assembly	OPEN	II
137	Threat	If metrology of existing CS or OBD indicates worse than expected condition	25	SUBASSEMBLY COMPLETION	then tile to tile requirements will not be met and redesign or refabrication may be required	Schedule and Cost impact	40%	0.25	1.0	0.10	Accept	No definitive reduction in probability. Use of metrology during fabrication of the CSC and installation of tiles to optimize design	0.04	Completion of subcomponent assembly	Open	II
287	Threat	Delivery time/cost increases due to challenges with part close tolerances	25	PROCUREMENT	Redesign/delays due to tolerance reviews	Increase in cost and schedule	50%	0.50	2.0	0.25	Accept	No definitive reduction in probability	0.25	End of procurements	OPEN	II
53	Threat	If there is a con-ops or machine protection issue	24	COMMISSIONING	then there will be a stand-down and delay to resolve issue	Schedule and Cost impact	10%	2.00	1.0	0.20	Accept	Review/upgrade of procedures and training to proactively minimize issues	0.20	completion of commissioning	OPEN	II
288	Threat	If a coil is damaged after assembly and installation on the machine	24	MACHINE ASSEMBLY	a new coil would need to be fabricated and the machine disassembled to install it	Increase in cost and schedule	20%	0.60	8.0	0.12	Accept	No definitive reduction in probability	0.12	Machine Commissioned	OPEN	II
92	Threat	If electrical testing causes damage to outer PF coils	21	COMPONENT OR ASSEMBLY TESTING	then the Outer PFs will have to be replaced	Schedule and cost impact	10%	1.00	6.0	0.10	Accept	Exercising best-practices and conservative measures to mitigate risk. No discrete action with definitive reduction probability or consequences.	0.10	Completion of coil testing	OPEN	II
135	Threat	If fabricated coils are damaged or lost in transit	21	FABRICATION	then new coils will have to be fabricated	Schedule and Cost impact	10%	1.00	6.0	0.10	Accept	No definitive reduction in probability / Spare coil conductor is being fabricated to enable fabrication of coils if required	0.10	end of assembly	OPEN	II
151	Threat	If a coil has an extreme exothermic reaction during fabrication	21	FABRICATION	Then repair or refabrication of the coil will be required	Schedule and Cost impact	10%	1.00	4.0	0.10	Accept	No definitive reduction in probability / Prototype coil fabrication was successful, lesson learned to be incorporated into improved procedures and oversight of fabrication	0.10	Completion of Fabrication	OPEN	II
279	Threat	If voids are formed between the studs and casing when the studs are attached to the casing	21	COMPONENT OR ASSEMBLY TESTING	The stud strength will be reduced	Operation	5%	1.00	3.0	0.05	Accept	No definitive reduction in probability	0.05	Machine reassembly	OPEN	II
2	Threat	If the sling fabrication has difficulty meeting dimensional tolerances	20	FABRICATION	then additional design work to resolve the tolerance issues may be required	Schedule and Cost impact	25%	0.30	3.0	0.08	Accept	No definitive reduction in probability / Prototyping has provided insights into fabrication techniques which minimize potential for occurrence. Close working relationship with fabricator inclusive of lessons learned knowledge transfer will also minimize the potential	0.08	End of fabrication	OPEN	II
34	Threat	If there is a lack of electrical engineers (C&IC) with specific skill sets	20	THROUGHOUT PROJECT	then work could be done incorrectly or inefficiently	Cost and Schedule impact. Delays critical path progress	25%	0.00	3	0.00	Accept	None / Develop man loaded schedule with targeted hiring for high skill positions and employing short term subcontractors for specific needs. Subcontract scopes which lend themselves to turnkey contracts. Establish BOAs with firms to augment staff. Dedicated HR liaison added to improve hiring process	0.00	FDR of PSS	OPEN	II

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40	Threat	If the neutron generator testing shows neutrons passing through unsealed penetrations	20	COMPONENT OR ASSEMBLY TESTING	then this may necessitate additional shielding of the Phase II penetrations listed in the requirements document	Schedule and Cost impact	25%	0.50	4.0	0.13	Accept	No definitive reduction in probability / Develop standard design for neutron shielding in Phase II penetrations, implement if required	0.13	Prior to commissioning	OPEN	II
58	Threat	If previously unplanned ICE or other major review, EIR, or meetings or audits are requested	20	THROUGHOUT PROJECT	then there will be unplanned diversions of key PM and engineering staff	Schedule and Cost impact	12%	0.50	2.0	0.06	Accept	No definitive reduction in probability / None	0.13	Project Completion	OPEN	II
74	Threat	If the CS casing is damaged during shipment	20	PROCUREMENT	Then repairs will be required	Schedule and Cost impact	15%	0.40	3.0	0.06	Control	Procurement of casing shipping case with custom manufactured supports to minimize potential for damage. Incorporated into procurement and being implemented (Budgeted by LOE in Job 6040 associated with Casing Fab)	0.02	Receipt at PPPL	OPEN	II
78	Threat	If vendors have performance issues that threatens either product quality or schedule in the fabrication of PF coils	20	FABRICATION	Then PPPL will have to fabricate tooling	Schedule and Cost impact	25%	0.30	2.0	0.08	Accept	No definitive reduction in probability / PPPL is establishing a winding line and will design tooling. If, during monitoring coil fabricators, vendor performance has a negative trend, fabrication of PF1B and/or C tooling will be triggered	0.08	End of coil fabrication	OPEN	II
80	Threat	If production coil fails pre- or post-vpi electrical acceptance tests	20	COMPONENT OR ASSEMBLY TESTING	then there may be loss of time & materials to that point in manufacture	Schedule and Cost impact	25%	0.25	4.0	0.06	Accept	No definitive reduction in probability / Ensure qualification of vendors, utilization of lessons learned in procedures, on site QA and Eng. oversight at fabrication facilities	0.06	Successful coil test	OPEN	II
86	Threat	If calculations show that there is insufficient He flow to achieve bakeout KPP temperatures	20	DESIGN	Then the He flow capability will require augmentation with a new blower	Schedule and Cost impact	25%	0.50	4.0	0.13	Accept	No definitive reduction in probability / Perform calculations early in PDR, scope augmented capability to minimize impact	0.13	FDR Bakeout	OPEN	II
91	Threat	FPDP Output Module Serial (FOMs) fail operational testing	20	COMPONENT OR ASSEMBLY TESTING	Need to troubleshoot and repair	Schedule and Cost impact	30%	0.05	2.0	0.02	Control	Perform operational testing as early as possible to ensure any issues are identified in a time period which allows for repair before it affects the project schedule (Activity in Commissioning COMM-1640 to test, replacements to be supplied by M&RP)	0.01	completion of component testing	OPEN	II
101	Threat	If helium line supports/brackets cannot be added at all custom locations	20	DESIGN	then it may be required to cut and reroute tubing in order to install adequate supports.	Schedule and Cost impact	20%	0.25	2.0	0.05	Accept	None / Do in-vessel inspection and Design/ Modify supports for each unique location. Validate by walkdown	0.05	Subcomponent assembly completion	OPEN	II
132	Threat	If there is difficulty restoring operation of all needed rectifiers	20	COMMISSIONING	Then troubleshooting and potential repair will be required	Schedule and Cost impact	50%	0.10	1.0	0.05	Accept	No definitive reduction in probability / Rectifier testing/readiness done in commissioning, Perform maintenance and pre-op testing	0.05	end of commissioning	OPEN	II
190	Threat	If construction work schedule overlaps with other WAFs scheduled work AND conflicts arise with work access	20	MACHINE ASSEMBLY	Then work will not be completed as scheduled	Schedule and Cost impact	20%	0.25	0.5	0.05	Accept	No definitive reduction in probability / Develop integration schedule and review at weekly meetings with CAMS to ensure conflicts are identified and mitigated prior to installation	0.05	Completion of installation	OPEN	II
282	Threat	If Center Stack Casing studs threads are deformed due to installation and removal of spirallock nut caps	20	COMPONENT OR ASSEMBLY TESTING	The PFCs using spirallock threading will not have the same restraint as designed and will have to be replaced.	Cost & Schedule	15%	0.50	3.0	0.08	Accept	No definitive reduction in probability	0.08	Machine reassembly	OPEN	II
97	Threat	If there is a failure in existing power system component(s) to support coil testing	16	COMPONENT OR ASSEMBLY TESTING	Then replace/repair of the failed component(s) will be required	Schedule and Cost impact	20%	0.05	2.0	0.01	Control	Project ensures that maintenance and testing prior to need for use as funded by M&RP: Perform maintenance and testing prior to need for use as funded by M&RP (Budgeted in LOE Job 1150 OPER X105 Activity OPER-1240, -1500)	0.01	End of coil testing	OPEN	II
99	Threat	If issues are uncovered with spare converters (Power supplies)	16	COMPONENT OR ASSEMBLY TESTING	Then additional repair/improvement is needed	Schedule and Cost impact	20%	0.10	2.0	0.02	Control	Perform maintenance and testing prior to use per M&RP (Budgeted in LOE Job 1150 OPER X105 and Commissioning Activity COMM-1980 for Dummy Load Testing)	0.01	Completion of assembly testing	OPEN	II
103	Threat	If 2D drawings used for fabrication/installation are not representative of the 3D models used for design/analysis or result in missing assembly interferences	16	MACHINE ASSEMBLY	then parts may not fit up as intended and repairs/rework/redesign may be required	Schedule and Cost impact	25%	0.10	2.0	0.03	Accept	No definitive reduction in probability / Early review of drawings and integration meetings to ensure early detection of issues. Perform field inspections early to minimize potential issues.	0.03	Completion of Machine Assembly	OPEN	II

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105	Threat	If tooling and fixtures required to perform fabrication/installation were overlooked	16	FABRICATION	then design/analysis of tooling/fixture is needed.	Schedule and Cost impact	20%	0.20	2.0	0.04	Accept	No definitive reduction in probability / Rigorous review of installation preparation and planning	0.04	Assembly	OPEN	II
113	Threat	If the number of pre-start ARR action items is larger than anticipated	16	COMMISSIONING	then additional time beyond that presently built into the schedule will be required	Schedule and Cost impact	20%	0.10	2.0	0.02	Accept	No definitive reduction in probability / Planning the ASO implementation carefully, including involvement of external experts and the ACC (internal review)	0.02	ARR completion	OPEN	II
114	Threat	If installing PCHERS passive plate creates interference issue for PP stiffener or support bracket	16	SUBASSEMBLY COMPLETION	then modification of parts will be required.	Schedule Delay	25%	0.10	2	0.03	Control		0.02	completion of subassembly	OPEN	II
179	Threat	If new PFC Langmuir probes are more fragile than anticipated	16	MACHINE ASSEMBLY	Then the probes may be damaged	Schedule and Cost impact	20%	0.15	0.5	0.03	Accept	No definitive reduction in probability.: Special procedures to ensure proper handling during installation	0.03	Completion of machine assembly	OPEN	II
183	Threat	If DCPS algorithms and force influence coefficients require large effort (more than simple corrections for turn counts)	16	DESIGN	Then more time for calculations will be required	Schedule delay	20%	0.10	1.0	0.02	Accept	No definitive reduction in probability	0.02	FDR	OPEN	II
199	Threat	If IBDV/IBDH tray or tile installation is more difficult than anticipated	16	MACHINE ASSEMBLY	then the installation will take longer than anticipated	Schedule and Cost impact	20%	0.15	0.5	0.03	Accept	No definitive reduction in probability	0.03	Completion of machine assembly	OPEN	II
4	Threat	If there is a lack of mechanical engineers and analysts with specific skill sets	15	DESIGN	then work could be done incorrectly or inefficiently or delayed	Cost and schedule impact. Delays critical path progress	10%	0.00	3	0.00	Control	Develop man loaded schedule with targeted hiring for high skill positions and employing short term subcontractors for specific needs. Subcontract scopes which lend themselves to turnkey contracts. Establish BOAs with firms to augment staff. Dedicated HR liaison added to improve hiring process. (Budgeted by LOE in Project Management Job 9000)	0.00	Retire by CDE-2/3A IPR	OPEN	III
50	Threat	If an unauthorized change to a credited control results in a USI	15	COMMISSIONING	then there will be a stand-down, review, and potential ARR repeat	Schedule and Cost impact	10%	0.20	3.0	0.02	Accept	Training on ASO requirements, including D-NSTX-OP-AD-131, and the introduction of screening for USI	0.02	end of commissioning	OPEN	III
125	Threat	If the final design and installation does not meet ARR expectations	15	DESIGN	Then redesign will be required	Schedule and Cost impact	10%	0.50	3.0	0.05	Accept	No definitive reduction in probability / Engage other ASO participants to understand current design philosophy and incorporate those lessons learned into design	0.05	Completion of ARR	OPEN	III
128	Threat	If the PPPL internal pre-review and ARR review don't happen as planned and delay the schedule	15	COMMISSIONING	Then additional work may be required	Schedule and Cost impact	10%	0.40	2.0	0.04	Accept	ASOIP and ARR plan to gain stakeholder acceptance and execute ARR properly. Hired Dedicated ASO Specialist for SAD.	0.04	Completion of ARR	OPEN	III
136	Threat	If coil is damaged during finished machining or assembly	15	SUBASSEMBLY COMPLETION	then the coil will need to be repaired	Schedule and Cost impact	10%	0.15	3.0	0.02	Accept	No definitive reduction in probability / Careful planning and conduct of work with QA oversight. Assumes repair will be affected	0.02	end of assembly	OPEN	III
141	Threat	M9-1, If activity detects a larger than anticipated flaw in the Outer PF coils.	15	COMPONENT OR ASSEMBLY TESTING	then a flaw may affect performance of coil	Schedule and Cost impact	10%	0.50	5.0	0.05	Accept	No definitive reduction in probability. Perform early inspection and testing / Perform early inspection and testing	0.03	completion of coil testing	OPEN	III
144	Threat	M9-3, if there is a rupture of an Inner TF leg cooling tube.	15	BAKEOUT	then there will be a loss of cooling and repairs will be required	Schedule and Cost impact	10%	0.30	2.0	0.03	Control	New design of cooling fitting and pre-operational testing	0.02	Completion of bakeout	OPEN	III
145	Threat	If there is a major weather event	15	THROUGHOUT PROJECT	Then no project work will be accomplished during that time	Schedule and Cost impact	10%	0.50	0.5	0.05	Accept	No definitive reduction in probability	0.05	Project Completion	OPEN	III
161	Threat	If there is difficulty to provide acceptable path for routing of power cables	15	SUBASSEMBLY COMPLETION	Then Alternate paths requiring significant new openings and supports will have to be developed	Schedule and Cost impact	10%	0.20	3.0	0.02	Accept	No definitive reduction in probability / With the completion of the design, the probability is very low, however, the risk still exists in case of unforeseen issues that may be encountered during installation.: With the completion of the design, the probability is very low, however, the risk still exists in case of unforeseen issues that may be encountered during installation.	0.02	Completion of subassemblies	OPEN	III

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172	Threat	If there is insufficient space for additional cable terminators on PCTS	15	SUBASSEMBLY COMPLETION	Then significant modifications to the PCTS are needed	Schedule and Cost impact	10%	0.05	3.0	0.01	Accept	No definitive reduction in probability / With the completion of the design, the probability is very low, however, the risk still exists in case of unforeseen issues that may be encountered during installation.: With the completion of the design, the probability is very low, however, the risk still exists in case of unforeseen issues that may be encountered during installation.	0.01	Completion of subassemblies	OPEN	III
180	Threat	M8-1 & M8-2, If a flaw in the design/analysis/fabrication of magnet system component is found.	15	COMPONENT OR ASSEMBLY TESTING	Then may have to lower operating parameters until complete resolution is determined	Schedule and Cost impact	10%	0.01	3.0	0.00	Accept	No definitive reduction in probability / Perform additional analysis, use Instrumentation to monitor system closely	0.00	Completion of component testing	OPEN	III
185	Threat	If the typical Rogowski winding vendor is unable to perform work	15	PROCUREMENT	Then additional vendor will be required to perform the work	Schedule and Cost impact	10%	0.05	3.0	0.01	Control	Identify other potential sources. Not completed yet. Mitigation covered by Procurement (lab funded).	0.00	Receipt of rogowsis	OPEN	III
201	Threat	If Field scope assessments (carbonite, spoked lid etc.) are negative	15	SUBASSEMBLY COMPLETION	Part will require replacement	Schedule and Cost impact	10%	0.05	3.0	0.01	Control	Inspect early	0.00	Completion of subassembly	OPEN	III
202	Threat	Current Limiting Reactors (CLRs) do not pass routine testing at supplier factory	15	PROCUREMENT	Supplier has to manufacture a replacement	Schedule and Cost impact	10%	0.05	3	0.01	Accept	No definitive reduction in probability / Award contract as soon as possible to minimize impact of schedule delay.	0.01	completion of procurement	OPEN	III
204	Threat	If a problem with a rectifier during the ISTP results in requirement to troubleshoot	15	COMMISSIONING	Then commissioning efforts will pause to troubleshoot the rectifier	Schedule and Cost impact	50%	0.01	0.5	0.01	Control	Do dummy load in advance, perform maintenance PMs, use spare rectifiers. See activity COMM-2320.	0.00	completion of commissioning	OPEN	III
215	Threat	If due to volatility of overhead rates, effects of tariffs or other reasons the cost of goods increases	15	PROCUREMENT	then costs will increase	Increased cost	10%	0.50	0.0	0.05	Accept	No definitive reduction in probability	0.05	Project Completion	OPEN	III
280	Threat	If there are not enough spares of the passive plate tiles to accommodate the required replacements	15	COMPONENT OR ASSEMBLY TESTING	New passive plate tiles will need to be manufactured	Cost	10%	0.50	0.0	0.05	Accept	No definitive reduction in probability	0.05	Machine reassembly	OPEN	III
285	Threat	If existing parts are damaged during passive plate repair work in-vessel	15	MACHINE ASSEMBLY	Redesign/repair of the damaged parts will be required	Increase in cost and schedule	10%	0.50	2.0	0.05	Accept	No definitive reduction in probability	0.05	Machine reassembly	OPEN	III
286	Threat	If Welds cannot be done as designed, at all locations	15	MACHINE ASSEMBLY	Redesign/reanalyze parts for that location	Increase in cost and schedule	10%	0.30	2.0	0.03	Accept	No definitive reduction in probability	0.03	Machine reassembly	OPEN	III
160	Threat	If the fabrication of high-precision PFC graphite or metal parts results in vendor failures to meet tolerances	12	FABRICATION	then there will be large number of rejected components	Cost & Schedule	10%	0.20	2.0	0.02	Control	Develop prototypes to verify manufacturability / Require first off the line acceptance from machining vendors. Have PPPL on site visits during machining. Procure excess material at the start. Validate alternate materials. Develop prototypes to verify manufacturability. PFC8-5010 thru PFC8-5030.	0.01	Completion of fabrication	OPEN	III
162	Threat	If the alignment of the CS assembly to the outer vessel coordinate system is more difficult than anticipated	12	MACHINE ASSEMBLY	then additional effort will need to be expended to make the installation	Schedule and Cost impact	10%	0.10	0.5	0.01	Accept	No definitive reduction in probability / Implement precise metrology to minimize potential for alignment issues	0.01	Post Assembly	OPEN	III
175	Threat	If a repairable arc occurs at coil leads or water fitting	12	COMMISSIONING	Then we will need to disassembly and repair	Schedule and Cost impact	10%	0.05	2.0	0.01	Accept	Meggar/hi pot test on a regular basis to preclude finding a leak	0.01	End of commissioning	OPEN	III
198	Threat	If a major vacuum leak is developed	12	BAKEOUT	then the bake will be paused for repair, potentially with the requirement to vent the machine	Schedule and Cost impact	10%	0.10	2.0	0.01	Accept	No definitive reduction in probability	0.01	Completion of bakeout	OPEN	III
203	Threat	If a difficult-to-find vessel or AC power ground loop occurs	12	MACHINE ASSEMBLY	Then an extended search of source of loop may be required	Schedule and Cost impact	10%	0.10	0.25	0.01	Accept	No definitive reduction in probability / Staging troubleshooting plan	0.01	completion of assembly	OPEN	III
205	Threat	If during installation a tile is damaged AND there are not sufficient spares	12	SUBASSEMBLY COMPLETION	Then new tiles will be required to be fabricated	Schedule and Cost impact	10%	0.05	1.0	0.01	Control	Purchase spares and acquire enough material to make at least 10 parts per region. Establish installation procedures to minimize damage potential. PFC8-1430, PFC8-1580, PFC8-1530	0.00	completion of assembly	OPEN	III

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ID	Type	Risk Description	Score	...at this time...	...then there will be this technical consequence	...which impacts the Project in this way.	Probability	Cost Impact (\$M)	Schedule Impact (Months)	Expected Monetary Value- EMV (\$M)	Risk Handling Approach	Mitigation Plan/Comments	Mitigated EMV	Risk Retirement Target Date	Status (OPEN or RETIRED)	LEVEL
206	Threat	If Camera/DVR Configuration and Testing is not Initially Successful	12	COMPONENT OR ASSEMBLY TESTING	Then the system will not perform as designed/required and investigation and possible redesign may be required	Schedule and Cost impact	10%	0.05	1.0	0.01	Accept	No definitive reduction in probability / Send unit back to vendor for replacement or install a tested spare unit in interim	0.01	Completion of assembly	OPEN	III
209	Threat	If there are unforeseen new PLC/HMI complications	12	BAKEOUT	then Control aspect lost / repairs required	Schedule and Cost impact	10%	0.10	1.0	0.01	Control	Testing of all circuits will validate proper operation . PTP activity HTHS-1260 in schedule.	0.00	completion of bakeout	OPEN	III
213	Threat	If problems occur with PF test stand during PF coil testing	12	COMPONENT OR ASSEMBLY TESTING	Then repairs/redesign may be required	Schedule and Cost impact	10%	0.05	1.0	0.01	Accept	No definitive reduction in probability / Assign resources to oversee this activity closely	0.01	Completion of testing	OPEN	III
216	Threat	If the new bakeout control system has complications	12	COMPONENT OR ASSEMBLY TESTING	then bakeout will stop until repairs are made	Schedule and Cost impact	10%	0.10	0.5	0.01	Control	Perform extensive PTP prior to bakeout. PTP activity HTHS-1260 in schedule.	0.01	completion of testing	OPEN	III
221	Threat	If the bakeout control system fails	12	BAKEOUT	then bakeout will stop until repairs are made	schedule delay	5%	0.10	0.5	0.01	Avoid		0.00	completion of bakeout	OPEN	III
225	Threat	Control System Failure	12	COMPONENT OR ASSEMBLY TESTING	then bakeout will stop until repairs are made	schedule delay	5%	0.05	1.0	0.00	Avoid		0.00	completion of testing	OPEN	III
230	Threat	If components do not fit as designed	12	SUBASSEMBLY COMPLETION	Then redesign or refabrication may be required	schedule delay	5%	0.03	1.0	0.00	Accept	No definitive reduction in probability / Integration meetings are held to review all interfaces and ensure that part designs will work. Also a focal point at all PDRs and FDRs	0.00	Completion of assembly testing	OPEN	III
232	Threat	If water flow in a coil is less than anticipated	12	COMMISSIONING	Then troubleshoot flow path or instrumentation will be required	Schedule and Cost impact	15%	0.01	0.5	0.00	Accept	Pre-op testing	0.00	Completion of subcomponent testing	OPEN	III
270	Threat	If mechanical instrumentation within the umbrella (TF Rosette, Belleville preload monitor, etc.) is damaged	12	MACHINE ASSEMBLY	then instrumentation will need to be repaired	Schedule and Cost impact	10%	0.10	0.3	0.01	Accept	No definitive reduction in probability / Careful work planning with appropriate cautions in work packages and pre-job briefs	0.01	completion of machine assembly	OPEN	III
224	Threat	If there is a Dual Pump Failure	9	BAKEOUT	then bakeout will stop until repairs are made	schedule delay	5%	0.05	0.5	0.00	Accept		0.00	completion of bakeout	OPEN	III
241	Threat	If some rectifiers are particularly challenged to complete their dummy-load qualifications	9	COMMISSIONING	then the time to trouble-shoot the rectifiers will be longer than anticipated	Schedule and Cost impact	10%	0.01	0.5	0.00	Accept	No definitive reduction in probability	0.00	completion of commissioning	OPEN	III
246	Threat	If machine instrumentation shows deviations from expected behavior	9	COMMISSIONING	Then effort will be expended on debugging sensors or understanding the source of the deviations	Schedule and Cost impact	10%	0.01	0.5	0.00	Accept	No definitive reduction in probability	0.00	completion of commissioning	OPEN	III