Jefferson Lab
Thomas Jefferson National Accelerator Facility

Task Hazard Analysis (THA) Worksheet

(See ES&H Manual Chapter 3210 Appendix T1
Work Planning, Control, and Authorization Procedure)

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Author:	M. Poelker	**Date:**	October 15, 2018	**Task #:** If applicable	

Complete all information. Use as many sheets as necessary

Task Title:	748.5 MHz Buncher Cavity Operation at the Upgraded Injector Test Facility (UITF)			**Task Location:**	UITF, High Bay Area of Test Lab
Division:	Accelerator	**Department:**	Center for Injectors and Sources	**Frequency of use:**	daily
Lead Worker:	M. Poelker				

Mitigation already in place:
Standard Protecting Measures
Work Control Documents

Ionizing Radiation Engineered Controls

- Below 7' height inside Cave 1, the walls provide concrete shielding of at least 55". Above 7', the East wall thickness is 27"
- The ceiling in the keV section of UITF is made of concrete at least 30" thick. Iron plate 3" thick is placed below cable penetrations.
- The ceiling of MeV section of UITF is made of 22" concrete.
- The main entrance to UITF is a labyrinth with walls 36" concrete and ceiling 22" concrete.
- Lead shielding at the trenches, and a grating that prevents UITF access via the helium vent at Cave2 – these are credited controls
- The 7 kW solid state RF amplifier can only be turned ON when UITF is swept clear of occupants and armed with Personnel Safety System (all doors are locked)

Sequence of Task Steps	Task Steps/Potential Hazards	Consequence Level	Probability Level	Risk Code (before mitigation)	Proposed Mitigation (Required for Risk Code >2)	Safety Procedures/ Practices/Controls/Training	Risk Code (after mitigation

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Sequence of Task Steps	Task Steps/Potential Hazards	Consequence Level	Probability Level	Risk Code (before mitigation)	Proposed Mitigation (Required for Risk Code >2)	Safety Procedures/ Practices/Controls/Training	Risk Code (after mitigation
1	Exposure to Ionizing Radiation	M	M	3	See Mitigations already in place described in OSP	A Personnel Safety System (PSS) has been designed and implemented to protect individuals from ionizing radiation during QCM commissioning with high power RF. Radiation Control Department has approved the UITF shielding and installed CARM radiation monitors outside the enclosure, that trip OFF the RF power when radiation levels exceed specified amounts. All shielding will be verified in place, in particular the Cave2 ceiling tiles that are designed to be removable. A sweep will be done prior to closing the UITF entrance door using the procedure referenced in the UITF OSP. No one will be inside the UITF enclosure during buncher commissioning.	1

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3	RF non-ionizing radiation	L	L	1	See Mitigations already in place described in OSP	A Personnel Safety System (PSS) has been designed and implemented to protect individuals from non- ionizing radiation during operation of the buncher and the ¼ cryomodule. A sweep will be done prior to closing the UITF entrance door using the procedure referenced in the UITF OSP. No one will be inside the UITF enclosure during buncher commissioning. The RF group will ensure that the rigid coaxial waveguide is completely secured and bolted together to ensure that no RF radiation can leak from the waveguide	1
4	Pressure / Vacuum	L	M	2	Category 1 vacuum system, no cryogenic fluids are involved in buncher operation.	The buncher was fabricated using conventional vacuum practice, there are no thin vacuum windows associated with the buncher. When the buncher is vented to atmosphere, we use pump carts that include 1 psi relief valves so that it cannot be pressurized above this value.	1
5							

Highest Risk Code before Mitigation:	3	**Highest Risk Code after Mitigation:**	1

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When completed, if the analysis indicates that the Risk Code before mitigation for any steps is "medium" or higher (RC≥3), then a formal Work Control Document (WCD) is developed for the task. Attach this completed Task Hazard Analysis Worksheet. Have the package reviewed and approved prior to beginning work. (See ES&H Manual Chapter 3310 Operational Safety Procedure Program.)

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Form Revision Summary

Periodic Review –

ISSUING AUTHORITY	TECHNICAL POINT-OF-CONTACT	APPROVAL DATE	REVIEW DATE	REV.
ESH&Q Division	Harry Fanning			

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