

# **JLab Plans for Integrated Cavity Processing (ICP)**

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**SRF Materials Mtg, February 2010**

(Informal contribution)

## JLab SRF Strategic Interest for DOE >> next 20 years

### Continue to lead the way in applied accelerator cavity preparation development

- Performance
- Flexibility
- Efficiency
- Quality assurance

>> **ICP** is the label we apply to the means

### Supporting this strategic interest requires *ongoing*

- ↓ Process research
- Process development with – single cell -> multi-cell structures
- Deployment for standard use on multiple projects
- Packaged tool specification for technology transfer



Local surface conditions  
Local process parameters

Building understanding in this domain is **research**.

Translating the current understanding into workable, desired application to cavities is **development**.

Implementing an intentional tool that provides a reliable application process is **process engineering**.

Controlled production processing

electrochemistry  
topography  
HPR

ILC 9-cells  
JLab upgrade  
VEP

ICP

# SNS HB cavity vertical EP prototype attempt at JLab

- *One step forward*
- Used helium vessel as water cooling jacket
- Limited by available power supply current
- Management of hydrogen bubbles is the greatest challenge
- Labor intensive, and just one process step



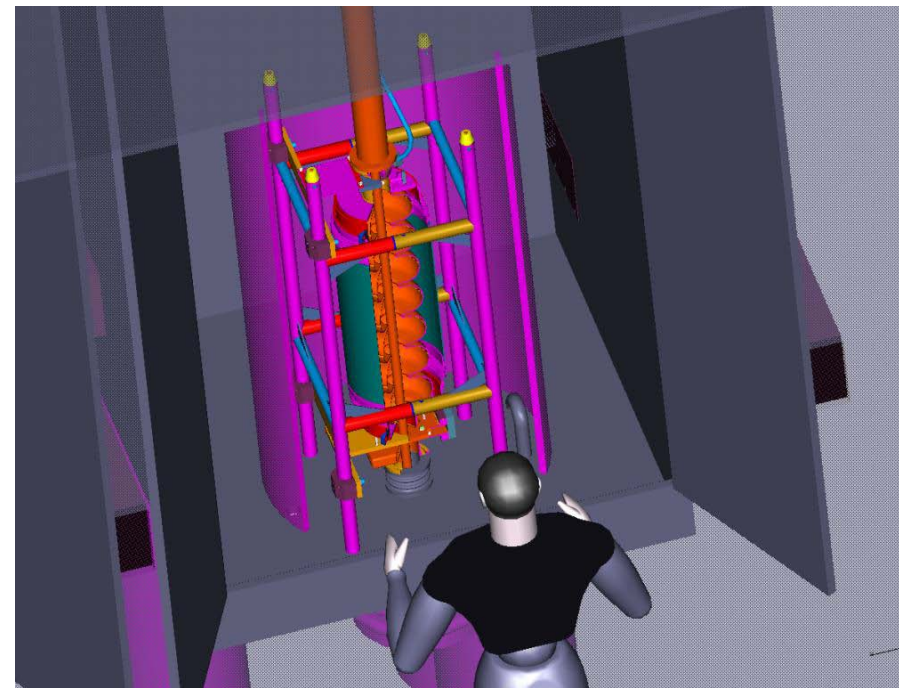
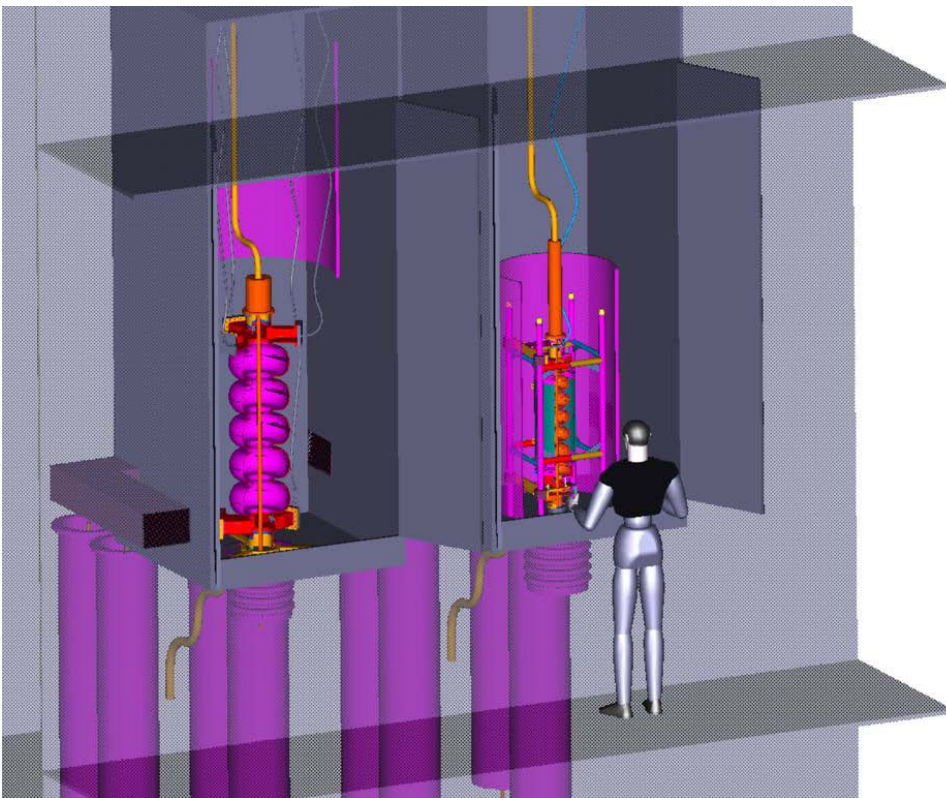
J. Mammosser

*We dream of something ten steps forward:*

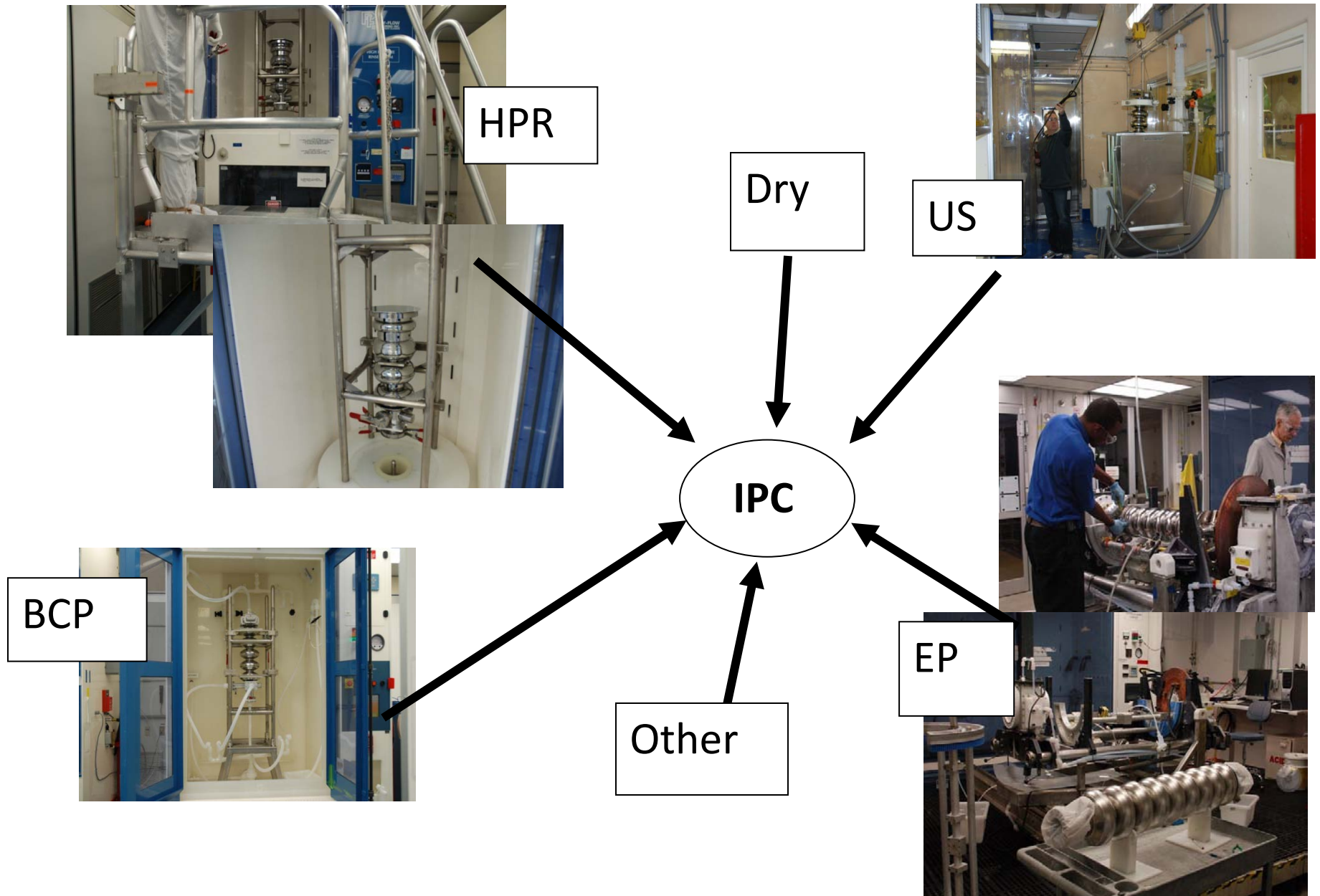
## The next step, ICP:

We need confident and variable multi-parameter process control.

- ICP units will integrate VEP, BCP, HPR, US, and HWR in an automated tool in a clean environment.
- The concept is to leave the cavity stationary and bring the sequential processes to the cavity.



# ICP will integrate multiple process steps with minimum handling



The Jefferson Lab TEDF Project is providing an appropriate facility envelope and necessary services for ICP units.

## **Technical and Engineering Development Facility (TEDF)**

A major DOE infrastructure upgrade at JLab

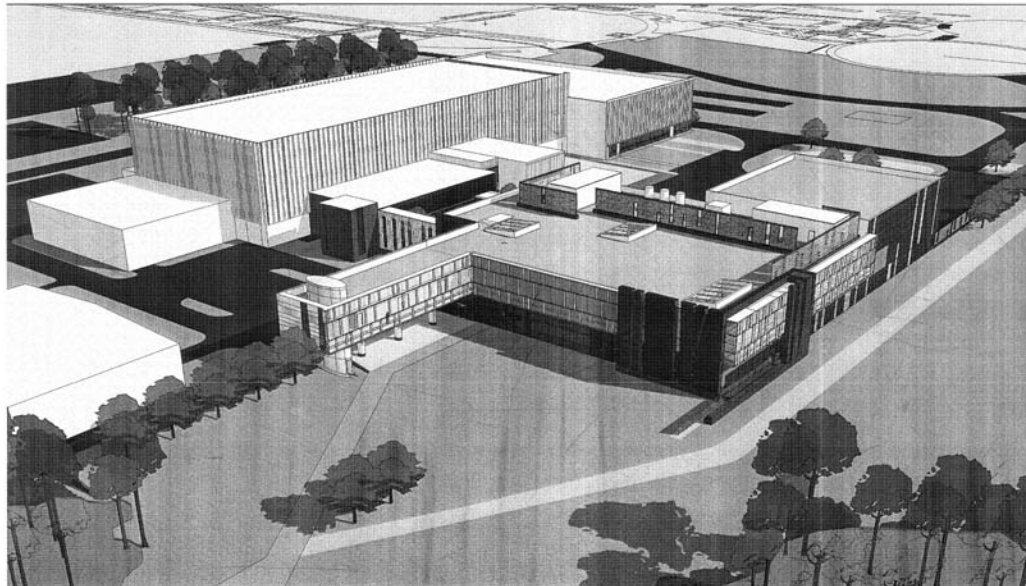
- New home for Engineering Division
- New home for Physics Div. detector development
- All new technical work areas for SRF
- Full renovation of the Test Lab to LEED Gold standards

**Jefferson Lab**

Technology and Engineering Development Facility (TEDF)  
Newport News, Virginia

Date: 01.08.2010

Issue No. 1 / EPP - FOR OWNER REVIEW



# SRF Facilities in TEDF Project

Advanced Conceptual Design 4/1/09

Chemistry, cavity treatments, and support areas

R&D

Cavity and cryomodule cryo/RF testing

Cleanroom

Cryomodule assembly

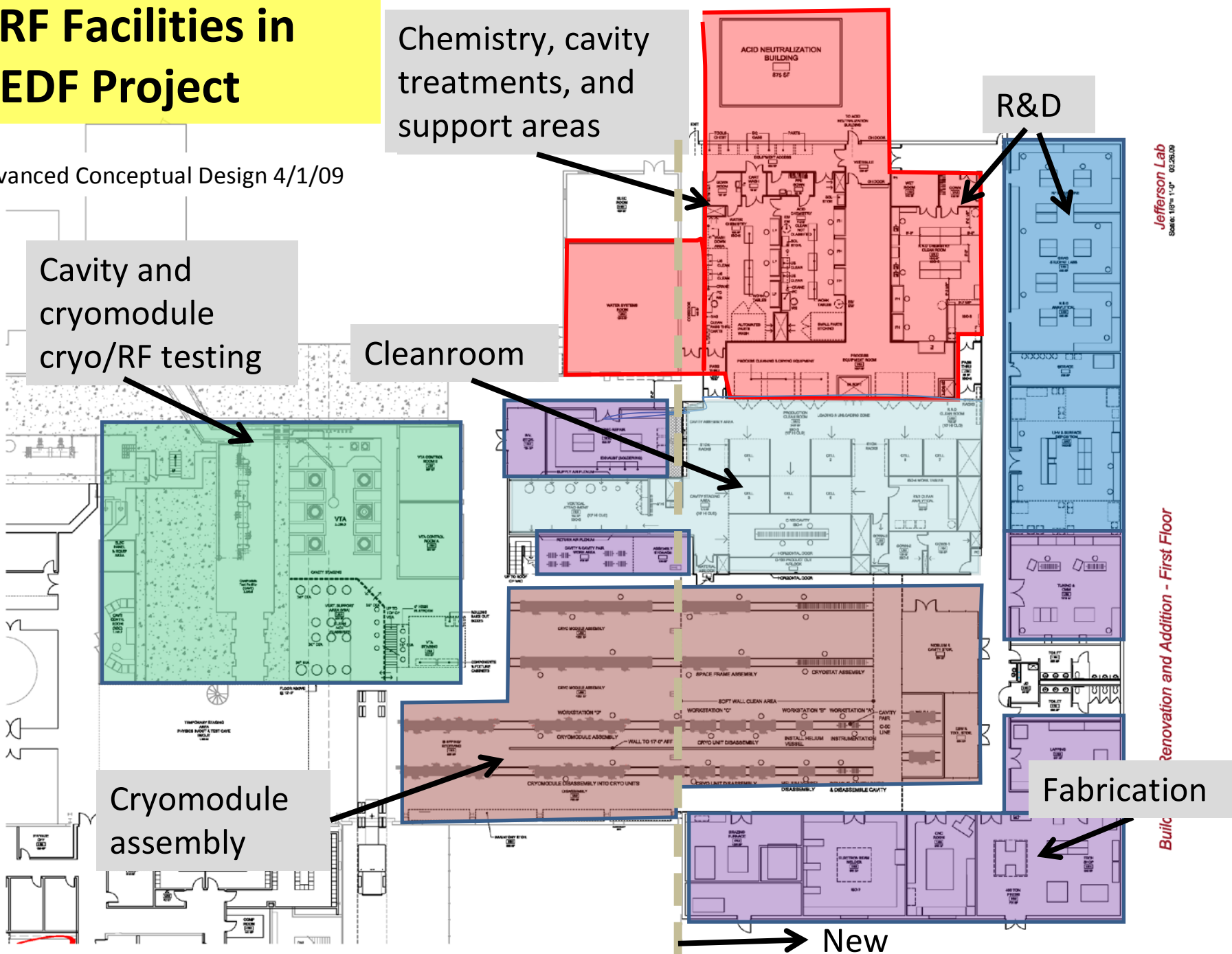
Fabrication

New

Jefferson Lab  
Scale: 1/8" = 1'-0"  
02/26/09

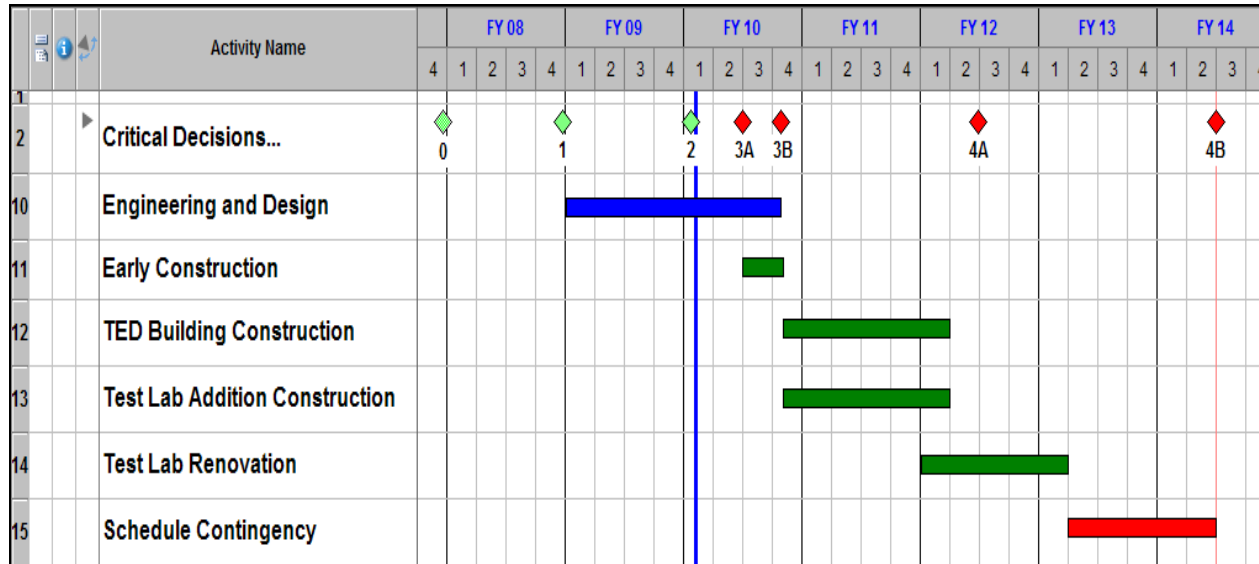
Renovation and Addition - First Floor

Built





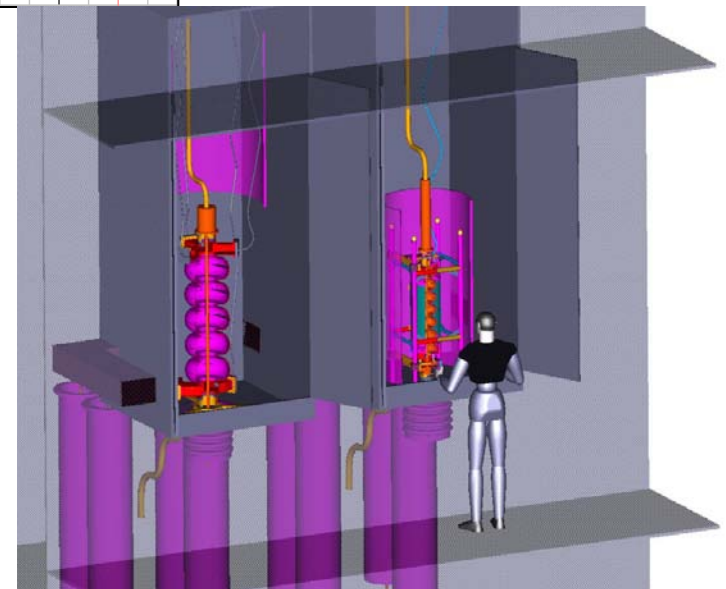
# TEDF Project Schedule

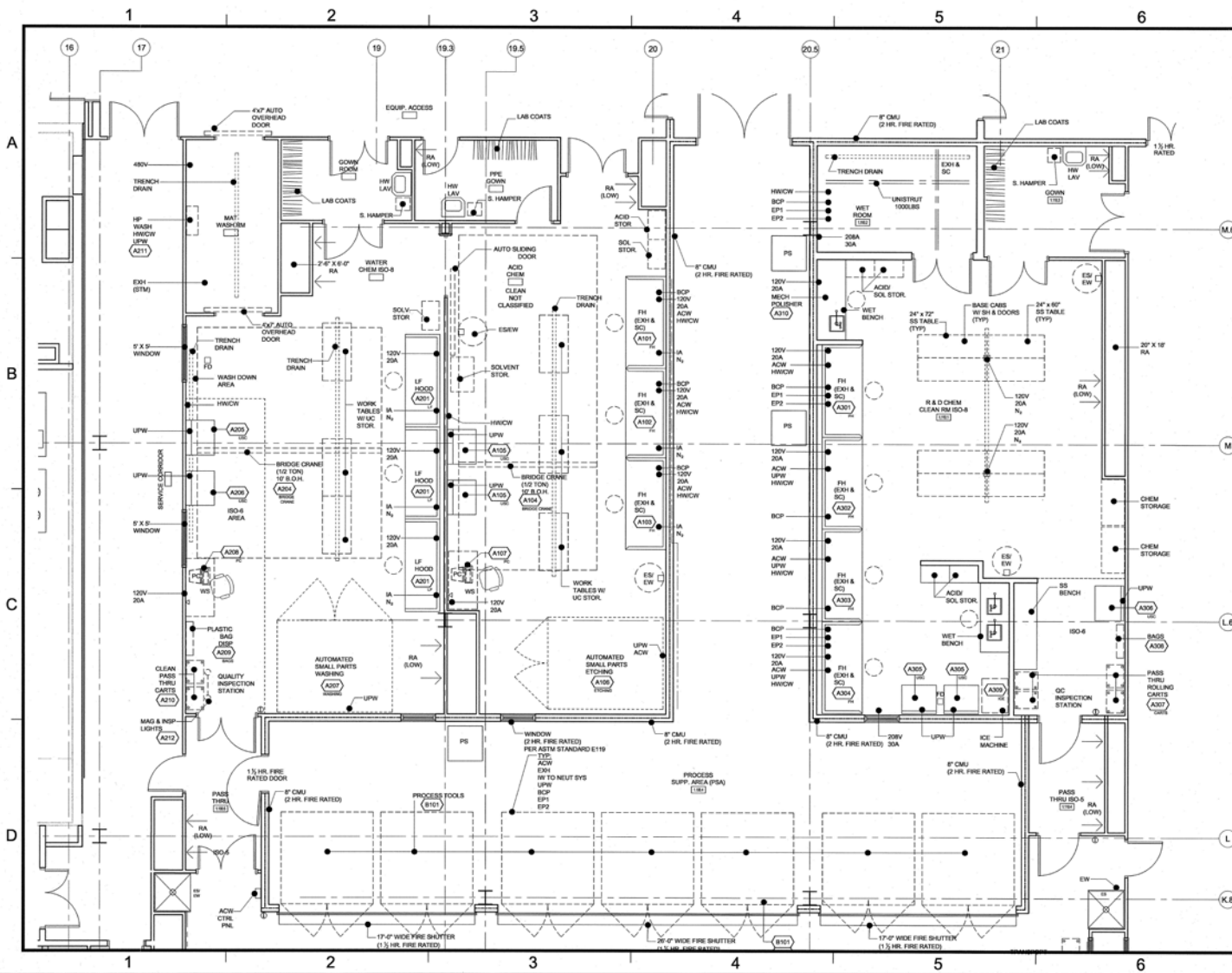


TEDF will have the required process support infrastructure for multiple ICP units

Presently we are:

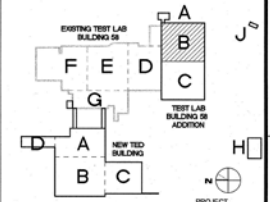
- Prototyping key interface elements
- Developing design requirements
- Soliciting partnerships with candidate toolmakers





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Project Manager: Ted Newell



**TECHNICAL ENGINEERING & DEVELOPMENT FACILITY (TEDF)**  
 12000 JEFFERSON AVENUE, NEWPORT NEWS, VIRGINIA 23606

80% SUBMITTAL	10/09/99		
REVISED 30% SUBMITTAL	06/29/99		
30% SUBMITTAL	07/06/99		
REV	ZONE	DESCRIPTION	APPR. DATE

FACILITY USERS		FACILITIES & LOGISTICS	
APPROVED	DATE	DESIGNER	DATE
-	-	-	-
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**Jefferson Lab**  
 TITLE: TEST LAB RENOVATION - BUILDING 58  
 ENLARGED FLOOR PLANS

SCALE: 1/8" = 1'-0"	DRAWING NUMBER:	SHEET: TLR-A2.1.1A	REV:
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