
JLab Overview & Cryomodule Results

C. H. RODE
JLAB Senior Team Leader

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Outline



- JLab scope
- 1-Oct-03 Cryomodule Snapshot
- 15-Jan-04 Cryomodule Snapshot
- FY04 & 05 JLab High Level Plan
- J. Mammosser: MB Cavity qualification and string assembly sequence

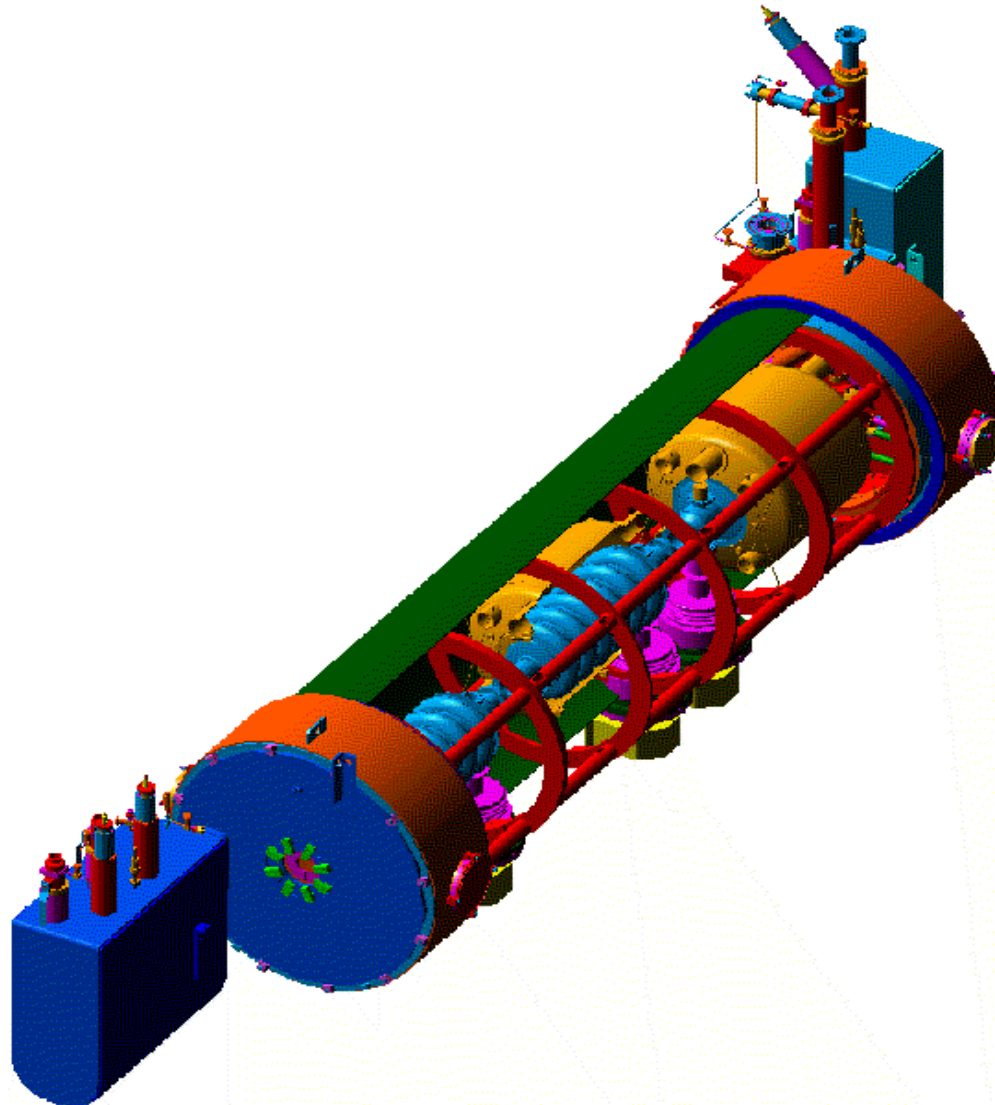
SNS Deliverables



- 2 year R&D Program
- 11 Medium beta 3-cavity cryomodules
- 12 High beta 4-cavity cryomodules
 - Feb-01 to Aug-03 high gradient development program ($E_{\text{peak}} = 27.5 \Rightarrow 35.0$ MV/m) for high beta cryomodules
- 120 g/sec Central Helium Liquefier
- Dual tee shaped transfer lines
- SRF 5 cryomodules/yr. facility – design only

90.8% complete (1-Jan-04)

SNS Medium Beta Cryomodule



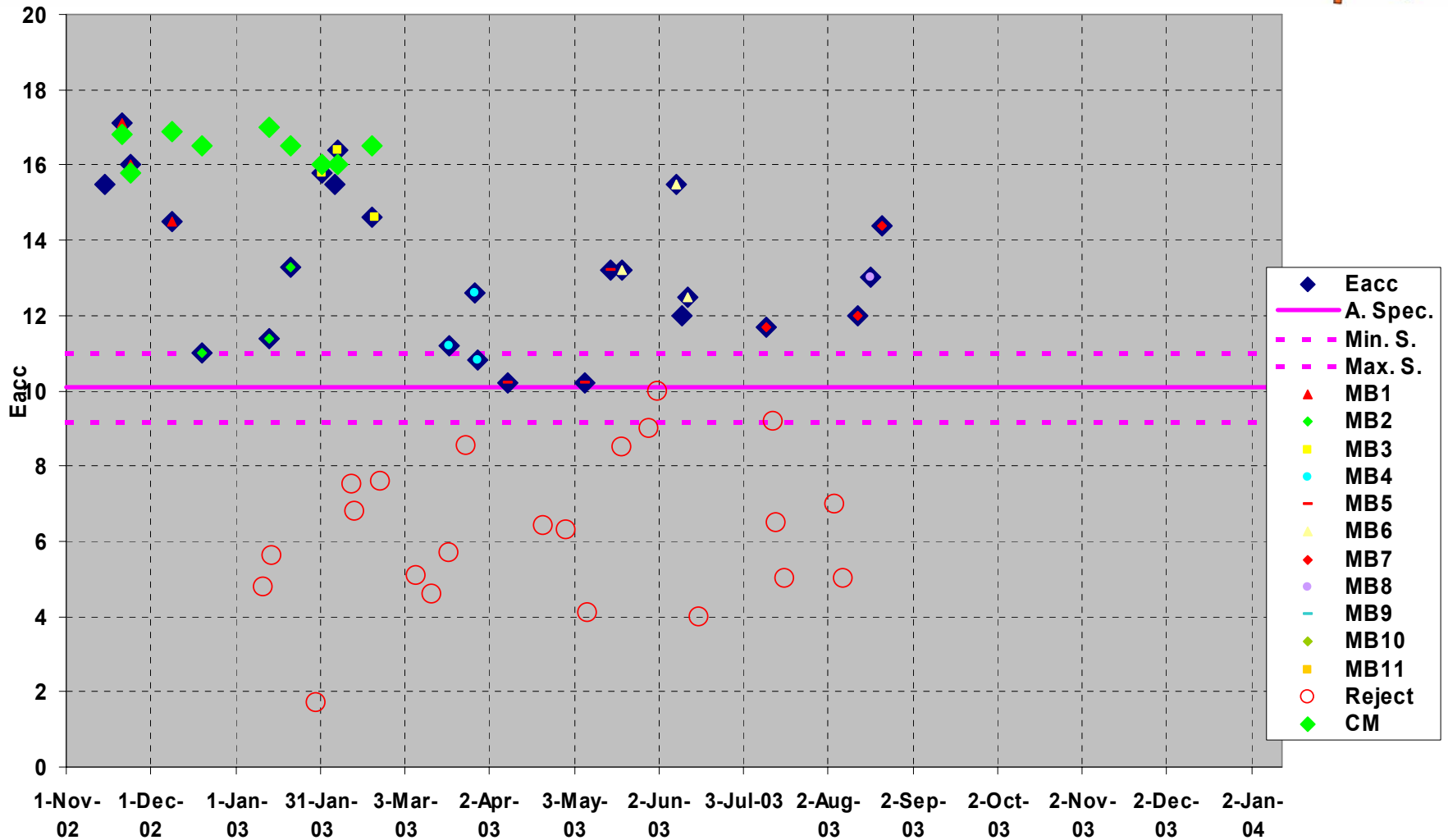
FY03 MB Cavity Qualification Problems



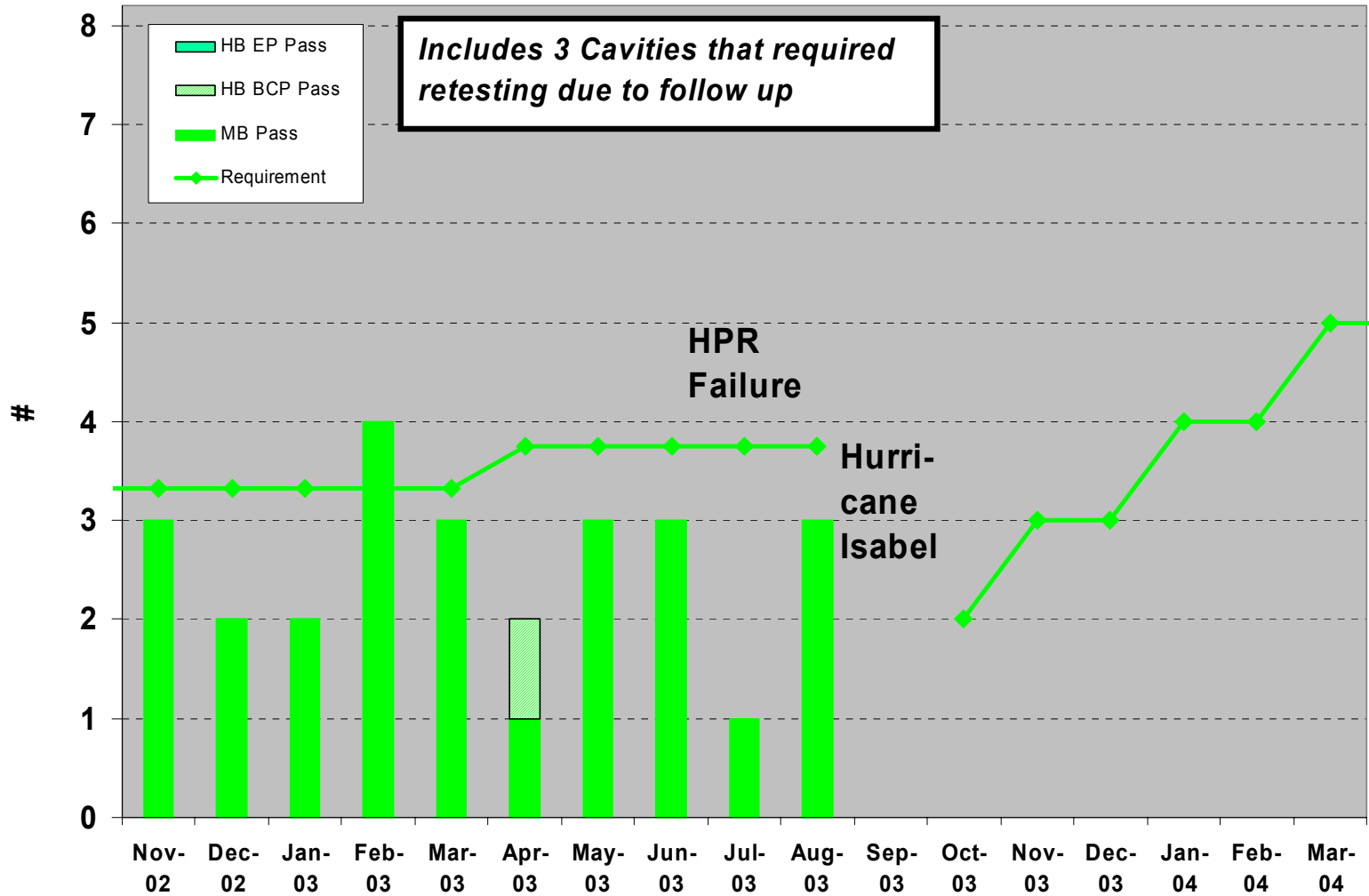
1. **3 month poor cavity performance (Mar – May 03)**
2. **High reject rate (Jan – Aug 03)**
3. **Component qualification and cryomodule testing delayed due to 1 MW RF system availability**
4. **Production interruptions due to equipment failures and Mother Nature**
5. **Very little correlation exists between CW VTA test and pulsed cryomodule test**
6. **\$70K/month cost variance**

SNS Medium Beta CM & Vertical Dewar Testing

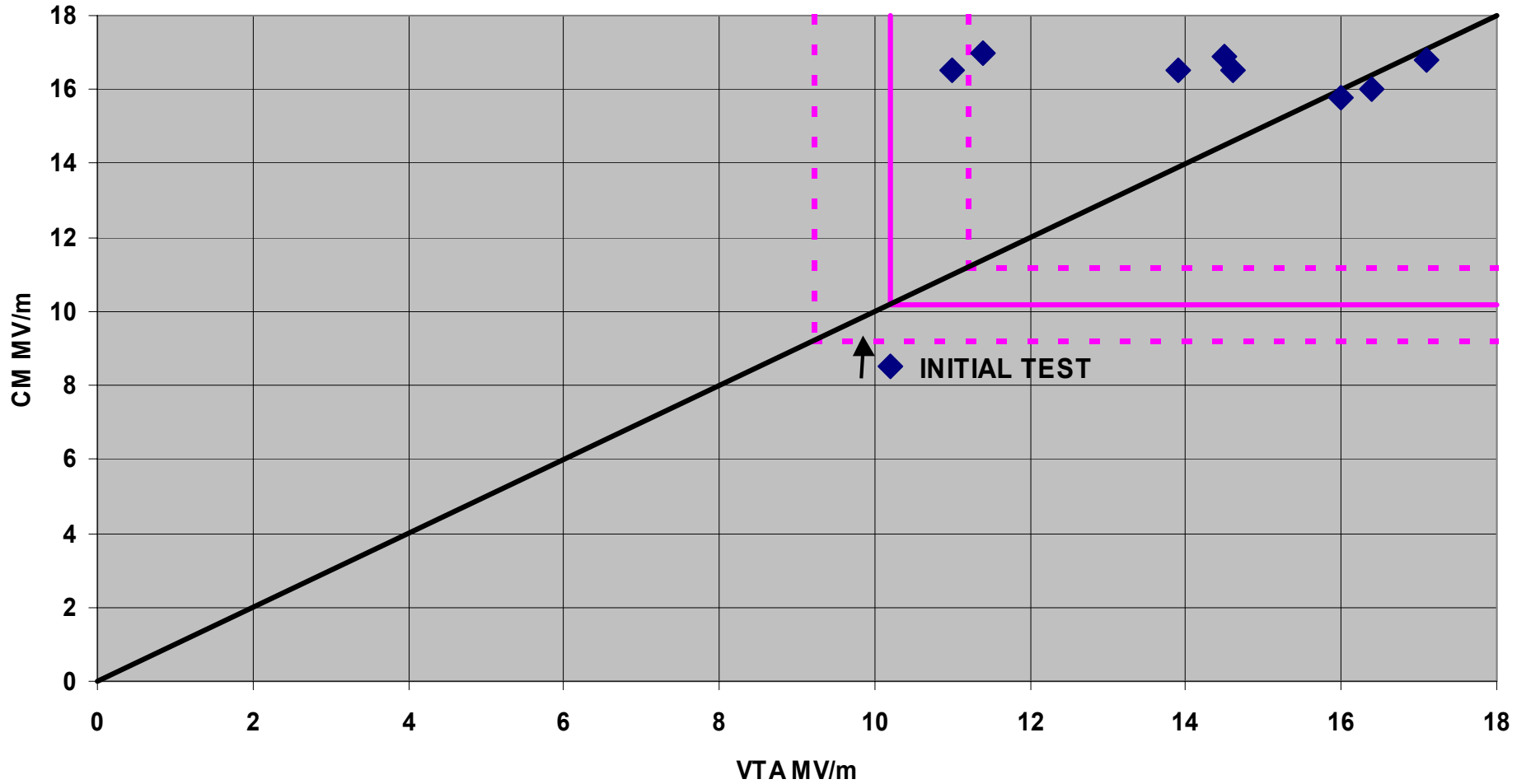
$E_{acc} @ Q_o = 5 \cdot 10^{**9}$



VTA Cavity Qualification



MB Cavity Performance CM vs VTA



1 MW RF System



- 1 MW RF fifth & sixth failure with this klystron
 - Operating with solenoid ground fault – repair plan exists
 - Operating with klystron water leak – pressure dependent

FY04 Problems



- 17-Sep Hurricane Restart
 - 4 weeks to restart
- 15-Nov HPR pump failure
 - 2 weeks off
- 15-Jan HPR pump failure
 - 2 weeks off

Cryomodule Production Status

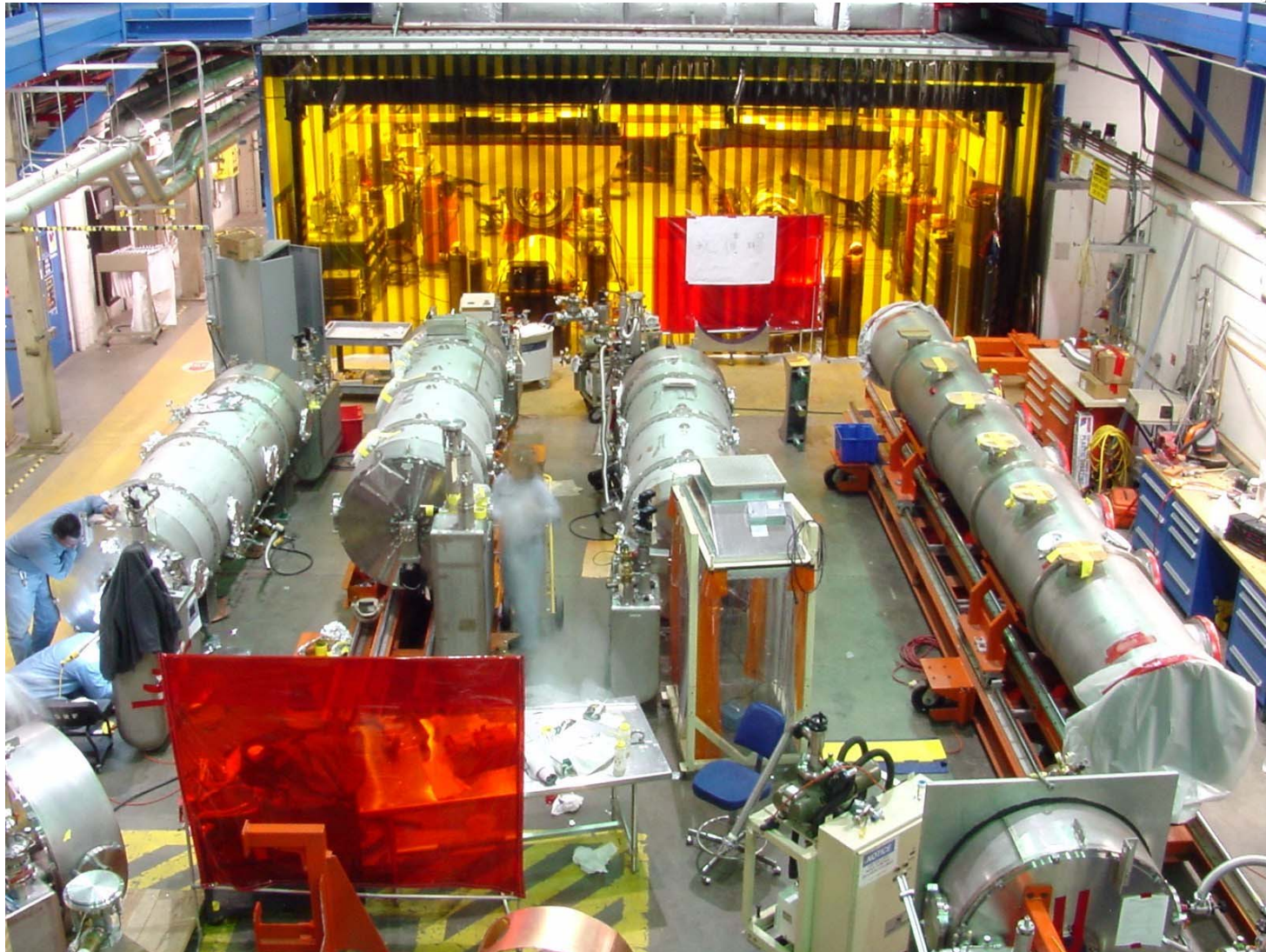


M-1-6	CM – in tunnel position #2 thru #7
M-7	CM – vacuum leak
M-8	CM – assembled
M-9	CM – being assembled
M-10, 11	Cavities qualified
H1	Cavities qualified
H-2,3	Cavities being qualified
H-4,5,6	Cavities being prepped
H-7,8	Cavities being incoming inspected

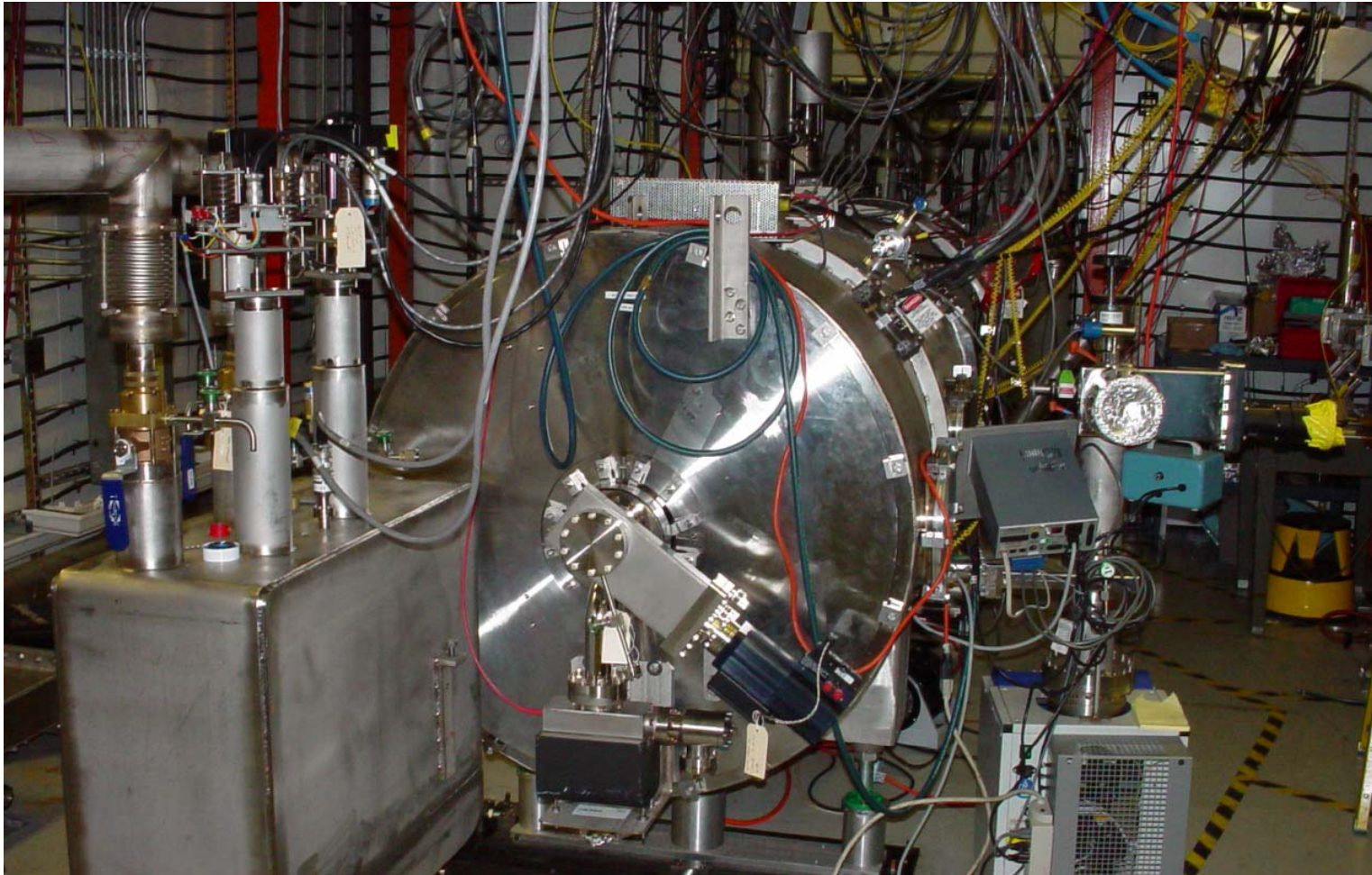
Cryomodules in SNS Tunnel



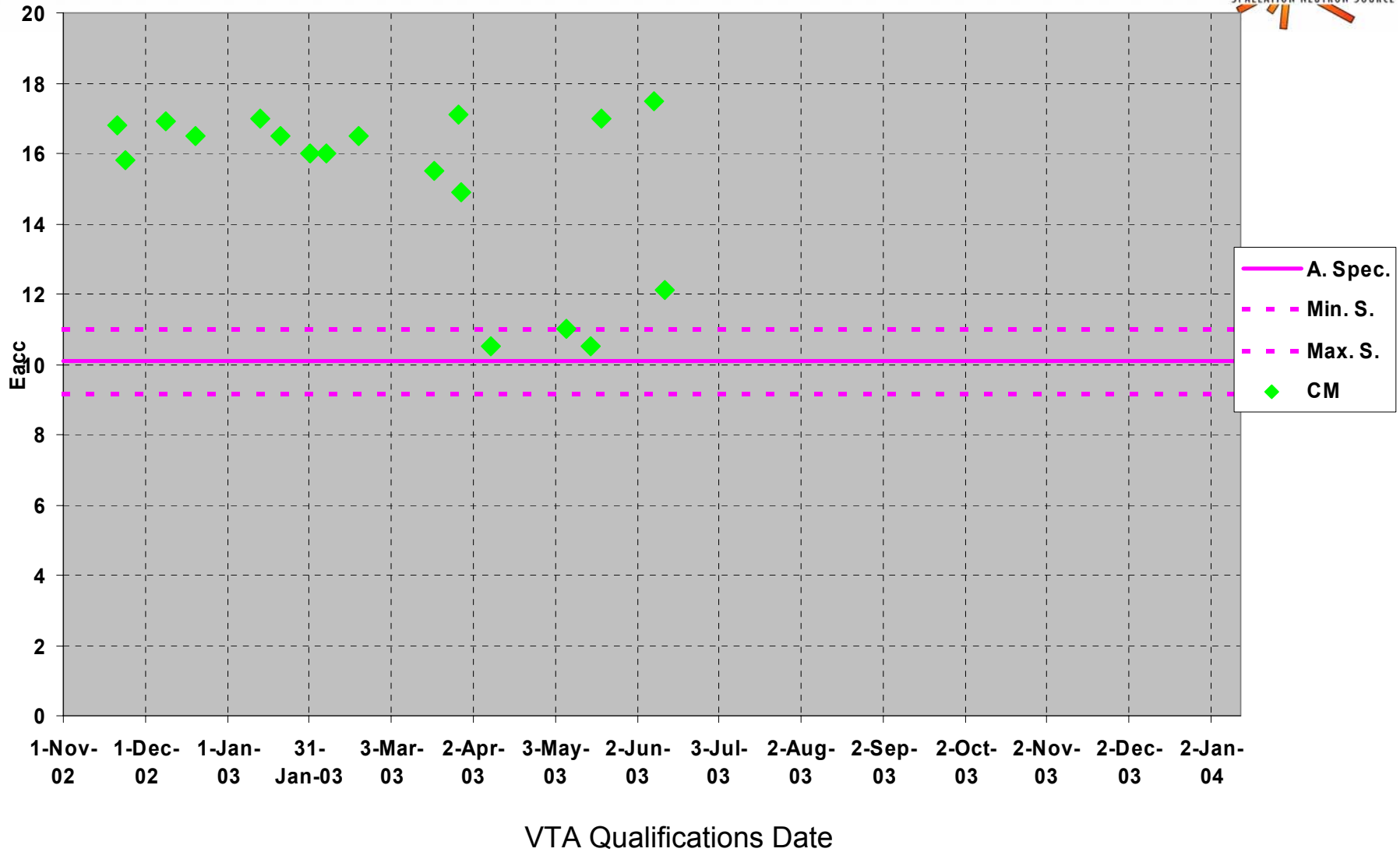
Cryomodules M4, thru M8 & FEL3



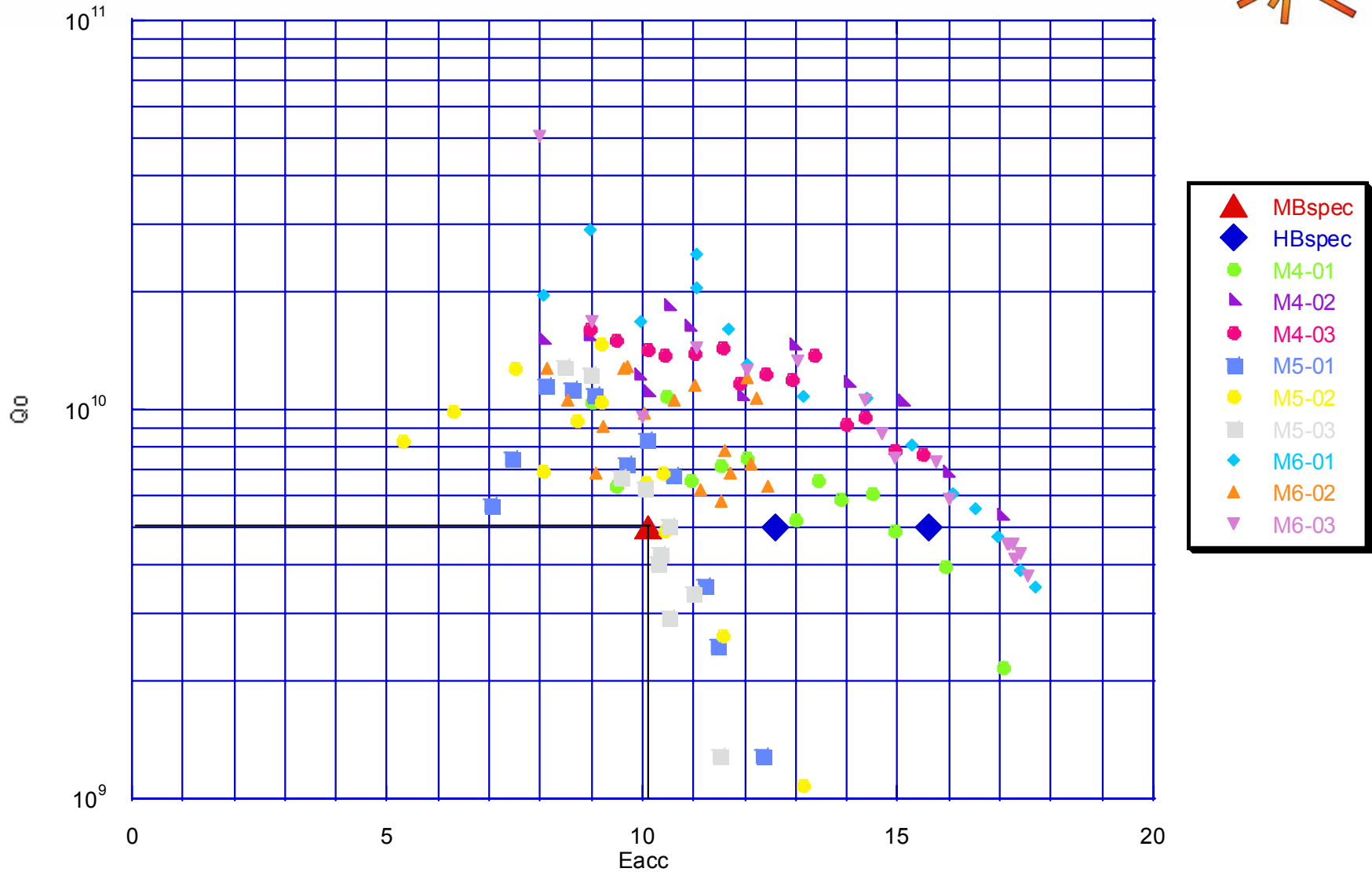
SNS M7 Cryomodule in Cave



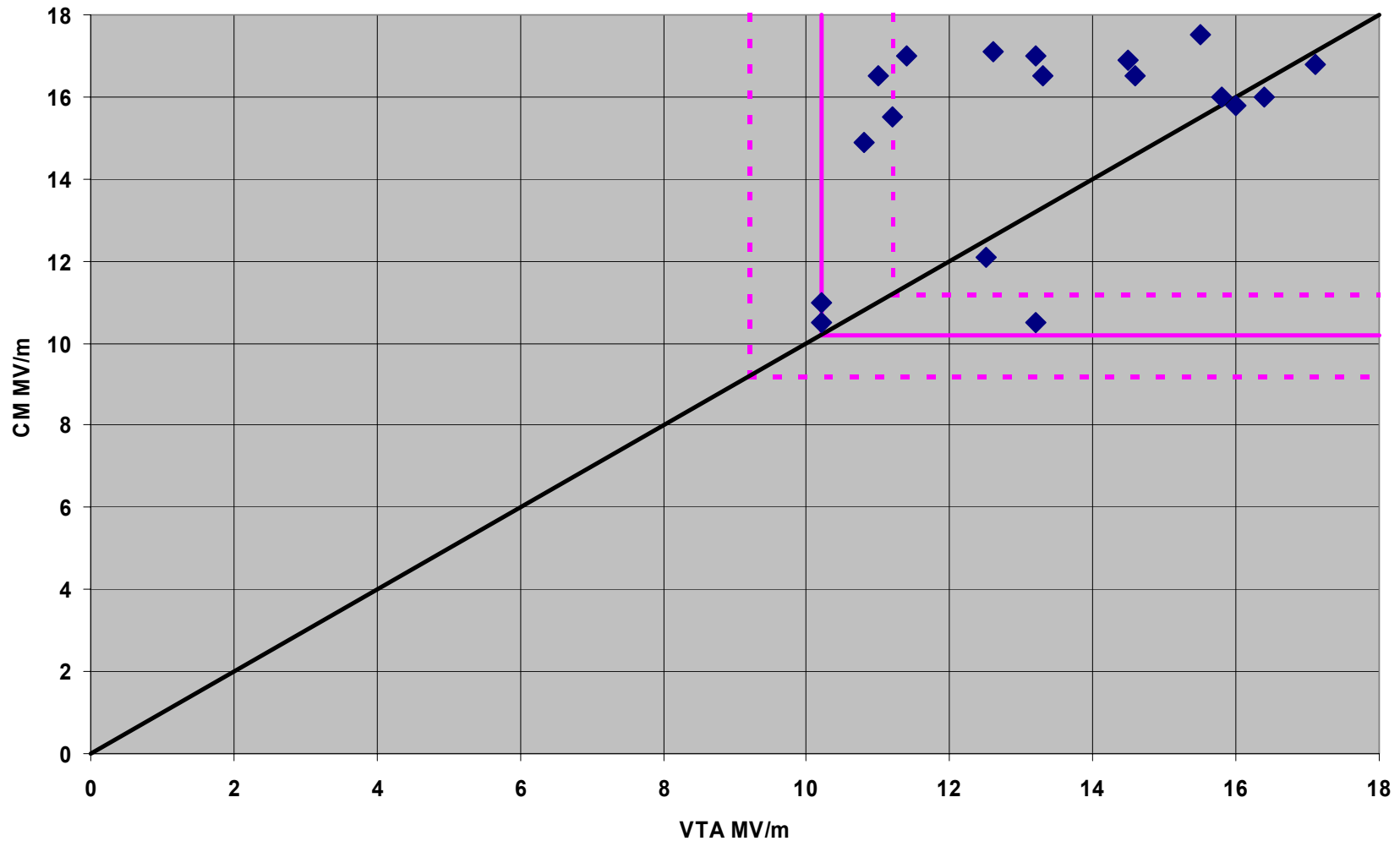
SNS Medium Beta CM $E_{acc} @ Q_0 = 5 \cdot 10^{**9}$



Cryomodule M4, M5, M6 Test Results



MB Cavity Performance CM vs VTA



JLab Superconducting Conclusions



- **Cryomodule**
 - Cavity qualification is currently >1 months ahead of plan
 - new procedure 86% success
 - MB cavity string assembly is currently at ~15 days/CM
 - Cryomodule assembly efficiency is steadily improving; currently at ~35 days/CM (2 rails)
- **Refrigeration**
 - All hardware has been delivered to ORNL; installation >99%
 - Check out and commissioning:
 - Screw compressors: operational
 - 4.5K Cold box: purification Feb
 - 2.1K Cold box: cold compressors installed

CM Assembly

