

# Acceptance Preparation for Deuterons at TTB and RHIC

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Acceptance Preparation Meeting

May 7, 2002

# Mission and Scope

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- Mission: complete tasks prior to ARR
- Scope: prepare the following for verification
  - Procedures
  - Administrative controls
  - Personnel training and qualification
  - Engineered safety systems in TVDG and TTB
  - Shielding changes for TTB
  - Use of deuterons in RHIC

# Modes of Operation

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- Deuterons can originate from either Tandem
- TTB line delivers beams to the Booster
- Booster, AGS, and AtR deliver beam to RHIC
- Au ions and d collide in RHIC

# Controls and Safety Systems

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- Setup for beam in TTB will be via TVDG Control Room
- Controls for beam operations will be via MCR
- Upgraded safety systems are similar to those at RHIC
- Upgraded TVDG/TTB safety systems include:
  - Access control subsystems
  - Radiation monitors
  - Critical devices

# ARR Committee Drivers

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- ARR starts September 1, 2002
  - C-AD achieves readiness for routine operation with d
  - ARR committee report October 1, 2002

# Training and Qualifications

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- Operations Training by September 1, 2002
  - MCR Operations Coordinator (1 per shift)
  - MCR Operator (1 per shift)
  - TVDG Operator (1 per shift)
  - RCT (1 per shift)
  - CAS (1 per shift)

# Mission

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- Upgraded TVDG/TTB engineered safety systems operating
- Shielding above TTB is 3-ft soil equivalent or greater
- RHIC is operating with deuterons

# Requirements, 9-1-02

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- All related RSC items are closed out (D. Beavis)
- Critical devices, current monitors, reach-backs established (D. Beavis)
- The ACS is operational and tested (A. Etkin, N. Williams)
- New sweep procedures are complete (C. Carlson, P. Ingrassia)
- New TVDG operations procedures are complete (C. Carlson, J. Alessi)
- Fault Study Plan prepared (J. Alessi)
- RSC Check-Off List prepared (J. Alessi)
- Accelerator Safety Envelope for TVDG/TTB is complete (E. Lessard)
- Training records for operations staff are complete (J. Maraviglia)
- Deuteron operations in RHIC within RHIC ASE (A. Stevens, D. Beavis)

# Specific Tasks

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N. Williams and J. Alessi:

- Add harp or equivalent at TVDG
- Add dual Chipmunk to limit beam current at TVDG harp
- Set Chipmunk interlocks at ~25 mrem/h
- Limit field in bypass dipoles for beam from MP6 to TTB
- Use equivalent method to limit beam energy from MP7, if used
- Add dual set of door interlocks:
  - TVDG accelerator room
  - Mechanical equipment room
  - TVDG control room
  - Target Room 4
  - TTB gate
  - Downstairs electrical equipment room
  - Downstairs mechanical equipment room

# Specific Tasks

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J. Alessi:

- Ensure TVDG operators are trained
- Create operation procedures in OPM Ch.12 to:
  - Limit hourly average deuteron currents to 200 nA
  - Limit terminal voltage to 6 MV
  - Limit dc average current to 200 nA or less
  - Restrict deuteron source to be MP6 only
  - Respond to Chipmunk alarms and interlocks
  - Disable 2nd set of door interlocks in TVDG
  - Minimize use of Faraday cups in TTB

# Specific Tasks

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Issues to be checked by RSC:

- Redundant interlock string switched in for deuteron operations
- Bypass-line dipole fields are limited
- Beam intensity monitor is locked in the inserted position
- Chipmunk interlocks are switched in
- The target-room-opening shields for scattered beam are in
- The shielding at beam opening to Target Room 1 is installed
- Entry into a TVDG tank requires a check for contamination by RCT
- A fault study at the NW corner of Tandem Control Room is performed
- A fault study near Rutherford Drive and TTB is performed
- The earth shield along TTB is 3-foot thick or more
- Two beam stops have been added at low energy end of MP6
- Two beam stops have been added at low energy end of MP7
- Logic and testing of ACS have been reviewed and approved
- New ACS wiring, logic and testing is documented
- All changes to existing ACS are configuration controlled
- The redundant ACS in TVDG is a QA1 system

# List of New/Updated Procedures

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(E. Lessard)

OPM 2.5.1, Operational Safety Limits for Tandem Van De Graaff

OPM 2.5.2, RHIC Accelerator Safety Envelope Parameters (Revised)

(P. Ingrassia)

OPM 4.56. Number to be determined, TVDG Sweep Checklist

OPM 4.56. Number to be determined, TTB Sweep Checklist

(N. Williams and A. Etkin)

OPM 4. Number to be determined, TVDG/TTB Security Gate Subsystem Check

OPM 4. Number to be determined, TVDG/TTB Crash Subsystem Test

OPM 4. Number to be determined, TVDG/TTB Critical Response Subsystem Checklist

OPM 4. Number to be determined, Confirmation of Proper System Operation of PASS for TVDG/TTB

# Next Steps

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- Meetings
- ✓ Family ATS
- Progress Reporting