UT-BATTELLE

Department of Energy Review of the SNS Instruments –Next Generation (SING) Project

# HYSPEC Instrument:

# Status and Performance

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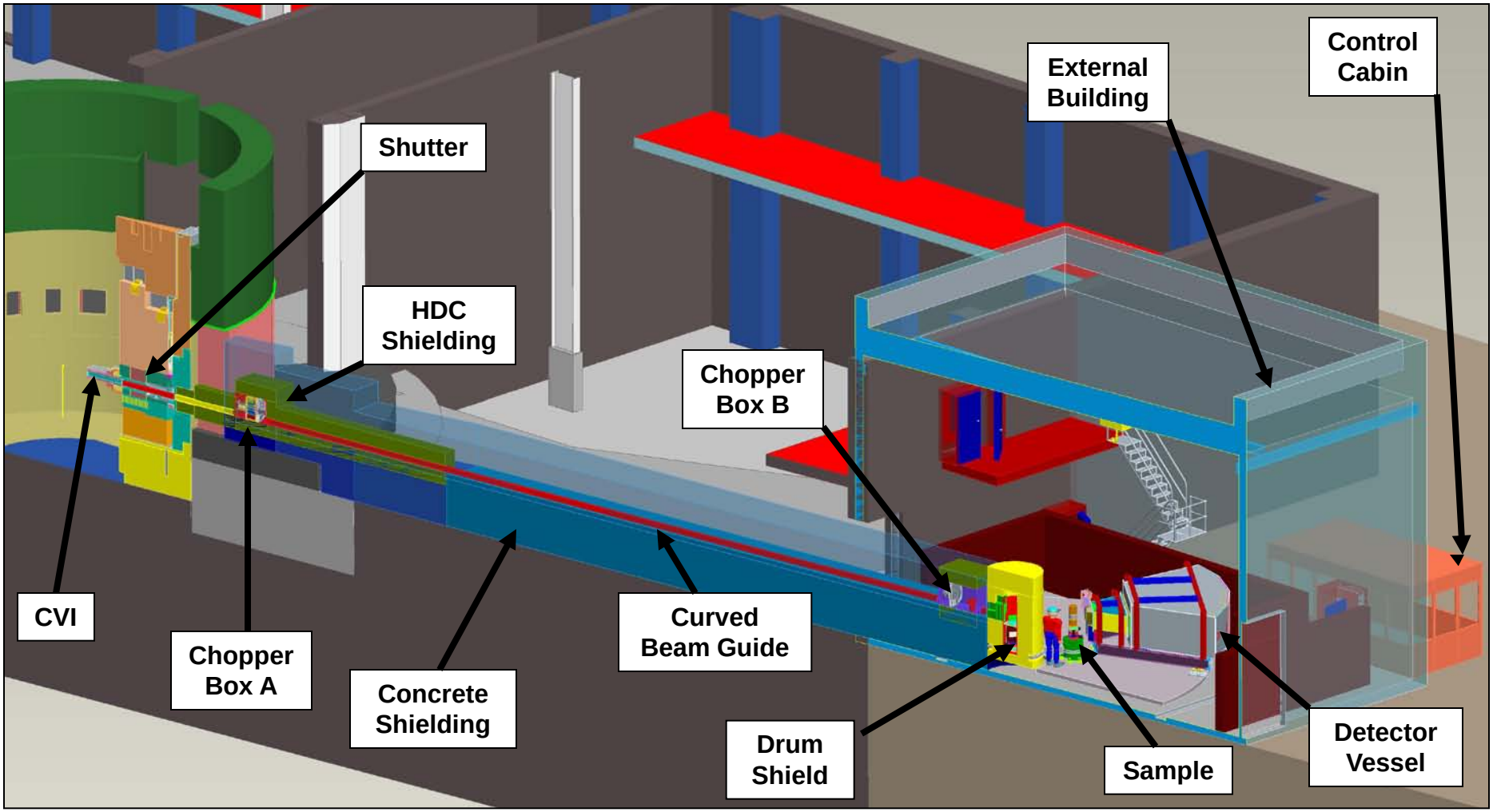
U. S. DEPARTMENT OF ENERGY

# Outline

- **Major Accomplishments in Last 6 Months**
- **Status**
  - **Cost and Schedule Performance**
  - **Milestones**
  - **Risks and Concerns**
- **Key Activities in Next 6 Months**
- **Response to Previous Reviews**
- **Summary**

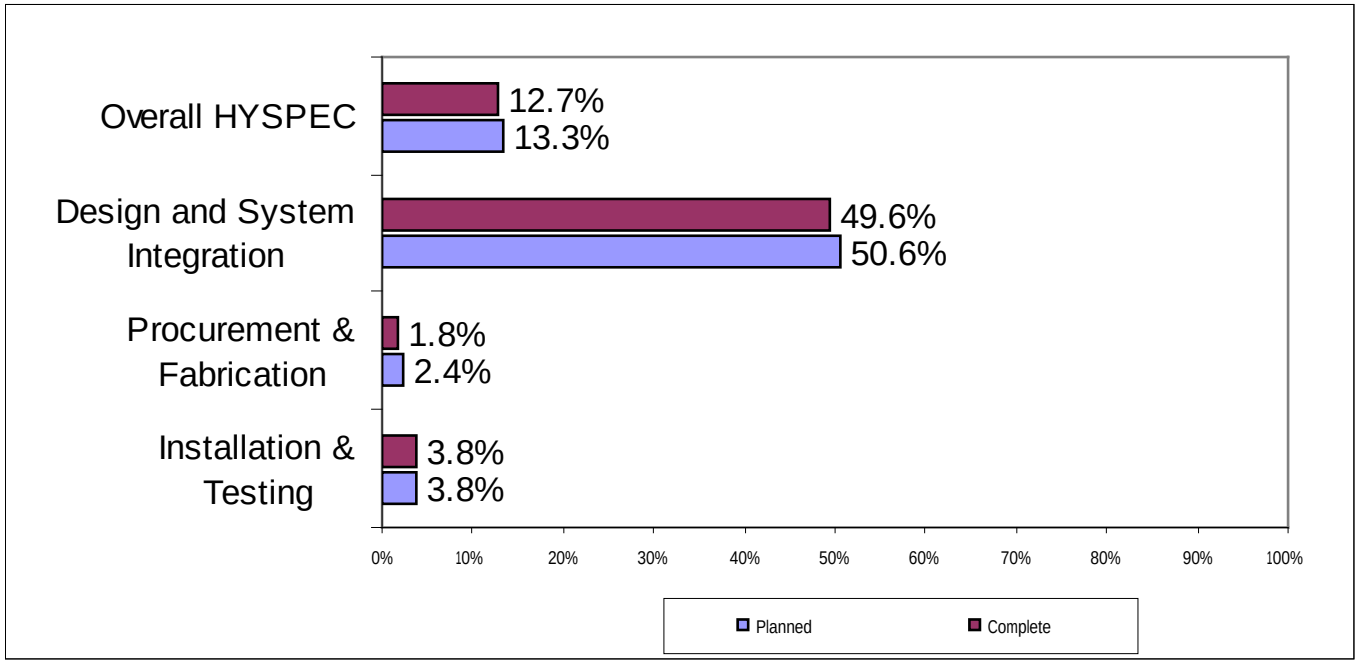
# Overview of HYSPEC Beamline



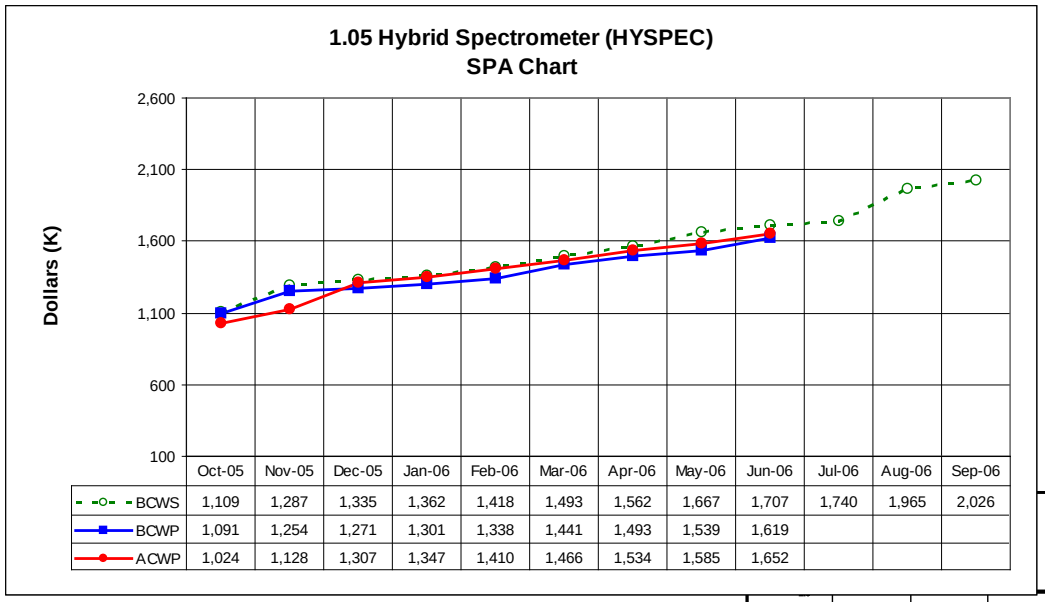
# Major Accomplishments

- **Installed Core Vessel Insert in Nov. 05 (before SNS CD-4)**
- **Completed and reviewed MCNP-X shielding simulations**
- **Designed and procured bulk shield insert (install in Sept. 06)**
- **Designed components of primary beamline system (guides choppers & vacuum) and held design review in preparation for procurement**
- **Specified the focusing crystal arrays in preparation for procurement**
- **IDT held a workshop on Polarized Neutron Analyzers and agreed for PSI to join HYSPEC IDT and contribute supermirror polarization analyzer, while SING provides 3He polarization analyzer. Extends energy range for polarization analysis from 3.6 to ~90meV.**

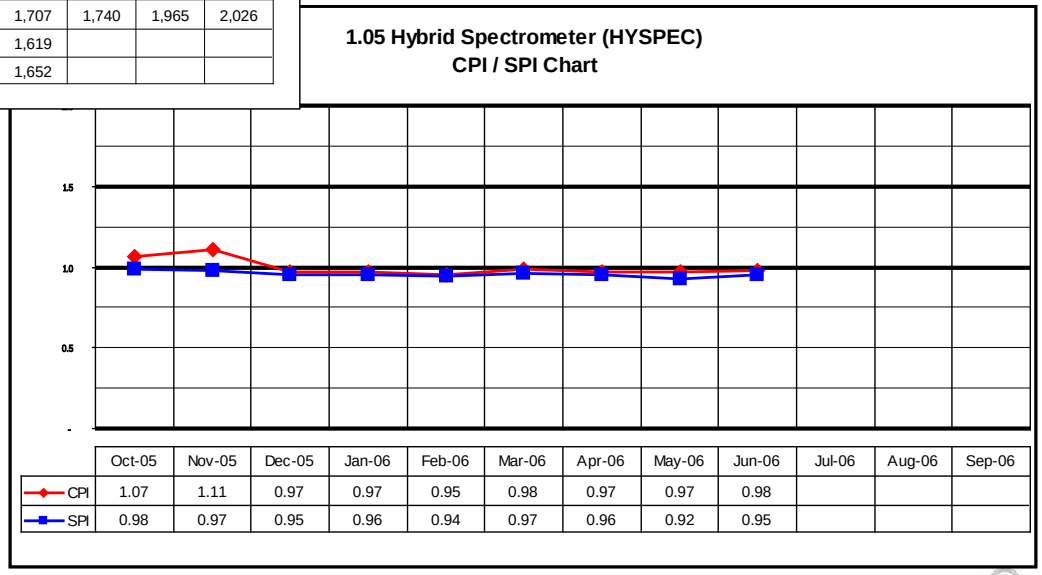
# HYSPEC Performance by Phase



# Excellent Cost and Schedule Performance




| | Oct-05 | Nov-05 | Dec-05 | Jan-06 | Feb-06 | Mar-06 | Apr-06 | May-06 | Jun-06 | Jul-06 | Aug-06 | Sep-06 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BCWS | 1,109 | 1,287 | 1,335 | 1,362 | 1,418 | 1,493 | 1,562 | 1,667 | 1,707 | 1,740 | 1,965 | 2,026 |
| BCWP | 1,091 | 1,254 | 1,271 | 1,301 | 1,338 | 1,441 | 1,493 | 1,539 | 1,619 | | | |
| ACWP | 1,024 | 1,128 | 1,307 | 1,347 | 1,410 | 1,466 | 1,534 | 1,585 | 1,652 | | | |




| | Oct-05 | Nov-05 | Dec-05 | Jan-06 | Feb-06 | Mar-06 | Apr-06 | May-06 | Jun-06 | Jul-06 | Aug-06 | Sep-06 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CPI | 1.07 | 1.11 | 0.97 | 0.97 | 0.95 | 0.98 | 0.97 | 0.97 | 0.98 | | | |
| SPI | 0.98 | 0.97 | 0.95 | 0.96 | 0.94 | 0.97 | 0.96 | 0.92 | 0.95 | | | |

# Baseline Change Table

## Shielding

MCNP-X calculations revealed could use HDC instead of steel

## T0 chopper

Revised budget estimate for T0 chopper much higher than in 05. By joining with ARCS & Sequoia can reduce the cost but still higher than baseline cost.

## 3He Analyzer

PSI joining IDT allows us to have both supermirror (low energy) & 3He (high energy) analyzers. Cost saving to baseline but different distribution of costs.

| Description | September Review BAC ($K) | Implement FY06+ Labor Rates ($K) (PCR SI-06-001) | Replace Supermirror Analyzer with 3He Polarization Analyzer ($K) (PCR HY-06-001) | Comments | July 06 BAC ($K) |
|---|---|---|---|---|---|
| **rid Spectrometer** | **12,666.1** | **122.3** | **0.0** | | **12,788.4** |
| **Integrated Design & System Integration** | **1,768.3** | **38.7** | **348.2** | | **2,155.2** |
| Integrated Design | 1,768.3 | 38.7 | 0.0 | | 1,807.0 |
| System Integration | 0.0 | 0.0 | 0.0 | | 0.0 |
| **Design** | **1,036.4** | **44.3** | **348.2** | | **1,428.9** |
| Detectors | 25.8 | 1.4 | 0.0 | | 27.2 |
| Optical Components | 177.7 | 3.6 | 348.2 | increased design costs for 3He analyzer over super mirror analyzer | 529.5 |
| Neutron Choppers | 155.1 | 5.1 | 0.0 | | 160.2 |
| Sample Enviroment | 50.0 | 2.8 | 0.0 | | 52.7 |
| Shielding | 325.2 | 16.4 | 0.0 | | 341.6 |
| Data Acquisition & Software | 0.0 | 0.0 | 0.0 | | 0.0 |
| Instrument Specific Support Equipment | 222.6 | 11.4 | 0.0 | | 234.0 |
| Instrument Infrastructure | 80.1 | 3.7 | 0.0 | | 83.7 |
| **Procurement & Fabrication** | **9,180.2** | **13.6** | **-459.4** | | **8,734.4** |
| Detectors | 484.1 | 1.3 | 0.0 | | 485.4 |
| Optical Components | 2,990.4 | 3.2 | -307.9 | decreased cost of 3He anlyzer (as compared to polarizing analyzer) | 2,685.7 |
| Neutron Choppers | 965.3 | 1.5 | 163.9 | increased cost of T0 chopper | 1,130.7 |
| Sample Enviroment | 259.0 | 1.7 | 0.0 | | 260.7 |
| Shielding | 2,754.9 | 1.9 | -315.4 | Steel shielding not required; neutronics approved HD concrete | 2,441.4 |
| Data Acquisition & Software | 142.3 | 0.2 | 0.0 | | 142.6 |
| Instrument Specific Support Equipment | 269.8 | 1.8 | 0.0 | | 271.7 |
| Instrument Infrastructure | 1,314.4 | 1.9 | 0.0 | | 1,316.3 |
| **Installation & Testing** | **681.1** | **25.8** | **111.1** | | **818.0** |
| Detectors | 27.1 | 3.1 | 0.0 | | 30.2 |
| Optical Components | 67.0 | 4.1 | 111.1 | Assembly and integration of 3He analyzer | 182.2 |
| Neutron Choppers | 54.0 | 3.6 | 0.0 | | 57.6 |
| Sample Enviroment | 26.0 | 2.3 | 0.0 | | 28.3 |
| Shielding | 269.0 | 6.2 | 0.0 | | 275.2 |
| Data Acquisition & Software | 5.1 | 0.6 | 0.0 | | 5.7 |
| Instrument Specific Support Equipment | 46.0 | 3.4 | 0.0 | | 49.4 |
| Instrument Infrastructure | 187.0 | 2.4 | 0.0 | | 189.5 |

# Design

| Activity ID | Activity Description | Forecasted Date | % Detailed design inherited | Progress on remaining design (thru Jul 06) | Total Estimated Design Complete | Escalated Award Amount | % of Procurements Complete |
|---|---|---|---|---|---|---|---|
| HY03021020 | Contract Award - Core Vessel Insert | 05-Apr-05 A | 100% | 100% | 100% | $ 131,732 | 2% |
| HY03023020 | Contract Award - Bulk Shield Liner | 06-Mar-06 A | 50% | 100% | 100% | $ 52,531 | 2% |
| HY03024120 | Contract Award - Beamguide 1a (Shutter Insert) | 28-Aug-06 | 25% | 100% | 100% | $ 44,391 | 3% |
| HY03031010 | Contract Award - T0 Chopper | 26-Oct-06 | 25% | 100% | 100% | $ 77,417 | 4% |
| HY03035020 | Contract Award - Chopper Box A | 26-Oct-06 | 10% | 100% | 100% | $ 21,559 | 4% |
| HY03025220 | Contract Award - Polarizing Focusing Crystals | 27-Nov-06 | 75% | 100% | 100% | $ 107,793 | 5% |
| HY03021130 | Contract Award - Shutter Insert | 21-Feb-07 | 50% | 100% | 100% | $ 131,327 | 7% |
| HY03031030 | Award Option - T0 Chopper | 12-Mar-07 | 25% | 100% | 100% | $ 232,617 | 10% |
| HY03024204 | Contract Award - Beamguide 1b | 2-Jul-07 | 25% | 100% | 100% | $ 52,928 | 10% |
| HY03025245 | Exercise Option - Polarizing Focusing Crystals | 27-Sep-07 | 75% | 100% | 100% | $ 502,105 | 16% |
| HY03071120 | Contract Award - U/S Vacuum Windows | 25-Oct-07 | 50% | 100% | 100% | $ 5,530 | 17% |
| HY03071125 | Contract Award - U/S Vacuum System | 25-Oct-07 | 10% | 100% | 100% | $ 16,589 | 17% |
| HY03024212 | Award Option - Beamguide 1c & Box A | 16-Nov-07 | 25% | 100% | 100% | $ 66,310 | 18% |
| HY03012030 | Contract Award - Beam Monitors | 26-Nov-07 | 75% | 100% | 100% | $ 26,543 | 18% |
| HY03012120 | Contract Award - Beam Monitor Interface Hardware | 26-Nov-07 | 0% | 100% | 100% | $ 5,530 | 18% |
| HY03032010 | Contract Award - T1a Chopper | 15-Jul-08 | 50% | 100% | 100% | $ 82,947 | 19% |
| HY03036020 | Contract Award- Chopper Box B | 30-Sep-08 | 10% | 100% | 100% | $ 56,736 | 20% |
| HY03032020 | Award Option - T1a Chopper | 24-Nov-08 | 50% | 100% | 100% | $ 127,656 | 21% |
| HY03025120 | Contract Award - Non-Polarizing Focusing Crystals | 26-Nov-08 | 75% | 100% | 100% | $ 113,472 | 23% |
| HY03033000 | Award Option - T1b Chopper | 21-Sep-09 | 50% | 100% | 100% | $ 127,656 | 24% |
| HY03024220 | Award Option - Beamguide 2 | 29-Sep-09 | 25% | 100% | 100% | $ 411,510 | 29% |
| HY03034020 | Contract Award - T2 (Fermi) Chopper | 27-Oct-09 | 50% | 100% | 100% | $ 174,632 | 31% |
| HY03034120 | Contract Award - T2 (Fermi) Chopper Slit Package | 27-Oct-09 | 50% | 100% | 100% | $ 24,448 | 32% |
| HY03072220 | Contract Award - D/S Vacuum Windows | 27-Oct-09 | 50% | 100% | 100% | $ 5,821 | 32% |
| HY03072225 | Contract Award - D/S Vacuum System | 27-Oct-09 | 10% | 100% | 100% | $ 17,463 | 32% |
| HY03024228 | Award Option - Beamguide Box B | 19-Feb-10 | 25% | 100% | 100% | $ 74,175 | 33% |
| HY03024236 | Award Option - Beamguide 4 | 26-May-10 | 25% | 100% | 100% | $ 70,320 | 34% |
| HY03011120 | Contract Award - LPSDs | 6-Oct-10 | 100% | 0% | 100% | $ 254,425 | 37% |

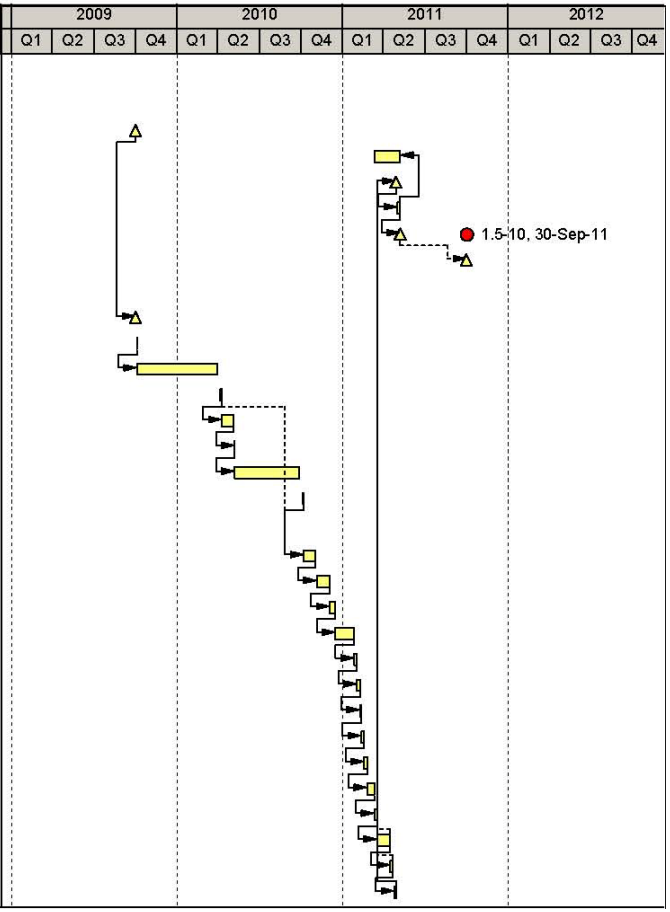
**Design in progress for approx 80% of procurements (or some words like that)**

# Design

| Activity ID | Activity Description | Forecasted Date | % Detailed design inherited | Progress on remaining design (thru Jul 06) | Total Estimated Design Complete | Escalated Award Amount | % of Procurements Complete |
|---|---|---|---|---|---|---|---|
| HY03060020 | Contract Award - DAS | 27-Oct-09 | 90% | 0% | 90% | $ 139,705 | 38% |
| HY03029151 | Contract Award - individual pumping cell systems | 18-Sep-08 | 75% | 0% | 75% | $ 97,572 | 40% |
| HY03011230 | Contract Award - 8-Packs | 24-Nov-09 | 75% | 0% | 75% | $ 89,644 | 41% |
| HY03011430 | Contract Award - Electronics | 24-Nov-09 | 75% | 0% | 75% | $ 67,524 | 41% |
| HY03051110 | Contract Award - 6-15m Steel Shielding | 30-Sep-08 | 25% | 60% | 70% | $ 478,475 | 47% |
| HY03051135 | Contract Award - 6-15m Concrete Shielding | 29-Jul-09 | 25% | 60% | 70% | $ 175,519 | 49% |
| HY03081120 | Contract Award - External Building Design | 26-Dec-07 | 50% | 0% | 50% | $ 132,715 | 51% |
| HY03081140 | Award Option - External Bldg Construction Contract | 29-Sep-08 | 50% | 0% | 50% | $ 1,077,981 | 64% |
| HY03029131 | Contract Award - Duplicate cell with GE180 glass | 16-Oct-08 | 50% | 0% | 50% | $ 22,517 | 64% |
| HY03042010 | Contract Award- Soller Collimator (2) | 27-Oct-08 | 50% | 0% | 50% | $ 10,349 | 65% |
| HY03029121 | Contract Award - NMR electronics, PS & computer control | 13-Mar-09 | 50% | 0% | 50% | $ 28,035 | 65% |
| HY03042075 | Contract Award- Mezei Flipper | 27-Oct-09 | 50% | 0% | 50% | $ 11,642 | 65% |
| HY03042080 | Contract Award- Guide Field | 27-Oct-09 | 50% | 0% | 50% | $ 11,642 | 65% |
| HY03042085 | Contract Award- Aperture | 28-Oct-09 | 50% | 0% | 50% | $ 20,956 | 65% |
| HY03041020 | Contract Award - Sample Table | 24-Nov-09 | 50% | 0% | 50% | $ 81,495 | 66% |
| HY03082220 | Contract Award - Interlock System | 27-Oct-10 | 50% | 0% | 50% | $ 47,779 | 67% |
| HY03083330 | Contract Award - Control Cabin | 27-Oct-10 | 50% | 0% | 50% | $ 11,945 | 67% |
| HY03083335 | Contract Award - Control Cabin Furniture | 27-Oct-10 | 50% | 0% | 50% | $ 5,972 | 67% |
| HY03083340 | Contract Award - Control Computer&Peripherals | 27-Oct-10 | 50% | 0% | 50% | $ 14,334 | 67% |
| HY03052020 | Contract Award - Shielding Drum Design | 11-Aug-08 | 40% | 0% | 40% | $ 276,489 | 71% |
| HY03052040 | Award Option - Shielding Drum | 29-Sep-09 | 40% | 0% | 40% | $ 1,164,211 | 85% |
| HY03052120 | Contract Award - Drum Shield Shutter | 27-Oct-09 | 40% | 0% | 40% | $ 19,209 | 85% |
| HY03051210 | Contract Award - 15-33m Shielding | 16-May-08 | 25% | 15% | 36% | $ 151,665 | 87% |
| HY03053020 | Contract Award - Detector Vessel Shielding | 27-Oct-09 | 25% | 0% | 25% | $ 123,406 | 88% |
| HY03054020 | Contract Award - Detector Vessel Enclosure Shielding | 27-Oct-09 | 25% | 0% | 25% | $ 64,032 | 89% |
| HY03073310 | Contract Award - Drives System | 27-Oct-10 | 25% | 0% | 25% | $ 47,958 | 90% |
| HY03051315 | Contract Award - Chopper Box B Shielding | 27-Oct-09 | 0% | 15% | 15% | $ 238,392 | 93% |
| HY03055020 | Contract Award - Beam Stop | 27-Oct-09 | 10% | 0% | 10% | $ 17,463 | 93% |
| HY03074420 | Contract Award - Gas System | 27-Oct-09 | 10% | 0% | 10% | $ 5,821 | 93% |
| HY03029141 | Contract Award - SEOP gas pump | 24-Jun-08 | 25% | 0% | 25% | $ 110,817 | 94% |
| HY03029111 | Contract Award - coils & framework | 27-Feb-09 | 20% | 0% | 20% | $ 33,554 | 95% |
| HY03029161 | Contract Award - filling station framework & procure valve sys | 11-May-09 | 0% | 0% | 0% | $ 22,517 | 95% |
| HY03011330 | Contract Award - 8-Pack Mounting | 27-Oct-09 | 0% | 0% | 0% | $ 23,284 | 95% |
| HY03026020 | Contract Award - Radial Collimator | 27-Oct-09 | 0% | 0% | 0% | $ 58,211 | 96% |
| HY03025310 | Contract Award - Focusing Crystals Translating Mechanism | 24-Nov-09 | 0% | 0% | 0% | $ 58,211 | 97% |
| HY03029020 | Contract Award - Coarse Collimator | 24-Nov-09 | 0% | 0% | 0% | $ 17,463 | 97% |
| HY03041025 | Contract Award - Drum Shield to Sample Arm | 24-Nov-09 | 0% | 0% | 0% | $ 104,779 | 98% |
| HY03075520 | Contract Award - Detector Vessel | 24-Nov-09 | 0% | 0% | 0% | $ 150,183 | 100% |

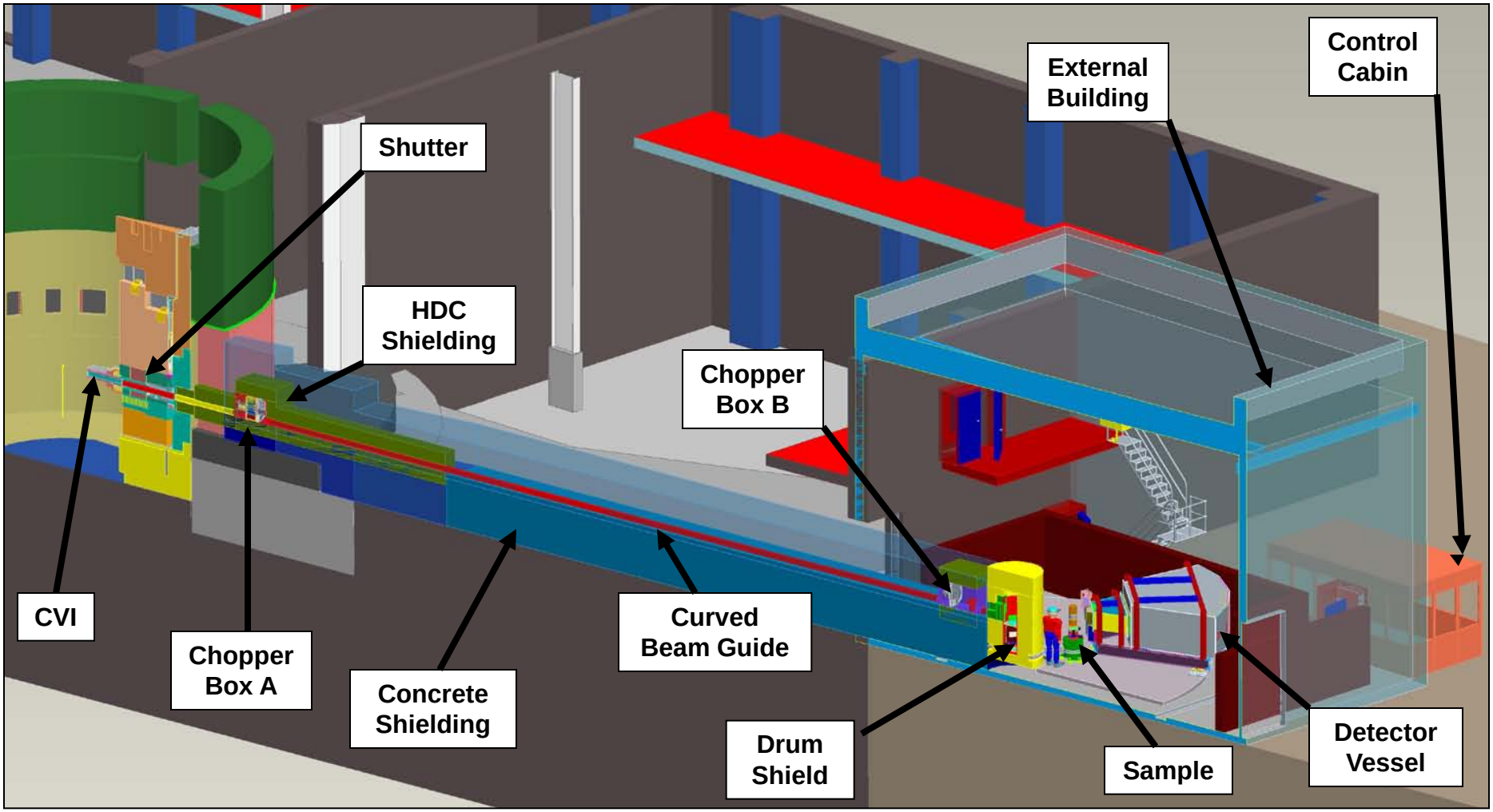
# Critical Path

| Activity Name | Start | Finish | Activity % Complete | Total Float |
|---|---|---|---|---|
| **1.05 Hybrid Polarized Beam Spectrometer (HYSPEC) BL-14b** | 01-Oct-09 | 30-Sep-11 | | 0d |
| **1.05.01 Integrated Design and System Integration** | 01-Oct-09 | 30-Sep-11 | | 0d |
| Begin FY10 | 01-Oct-09 | | 0% | 0d |
| Prepare Operations Documentation | 11-Mar-11 | 06-May-11 | 0% | 101d |
| HYSPEC Installation Complete | | 29-Apr-11 | 0% | 101d |
| HYSPEC Instrument Readiness Review | 02-May-11 | 06-May-11 | 0% | 101d |
| HYSPEC Complete | | 06-May-11 | 0% | 101d |
| CD-4e HYSPEC | | 30-Sep-11* | 0% | 0d |
| **1.05.03 Procurement and Fabrication** | 01-Oct-09 | 05-Oct-10 | | 101d |
| Begin Procurement - 6-15m Shielding | 01-Oct-09 | | 0% | 101d |
| Contract Award - 6-15m Steel Shielding | 02-Oct-09 | 02-Oct-09 | 0% | 101d |
| 6-15m Steel Shielding - Manufacturing Period | 05-Oct-09 | 29-Mar-10 | 0% | 101d |
| 6-15m Shielding - On Site | 07-Apr-10 | 07-Apr-10 | 0% | 101d |
| Procurement Review & Bid - 6-15m Concrete Shielding | 08-Apr-10 | 05-May-10 | 0% | 101d |
| Contract Award - 6-15m Concrete Shielding | 06-May-10 | 06-May-10 | 0% | 101d |
| 6-15m Concrete Shielding - Manufacturing Period | 07-May-10 | 27-Sep-10 | 0% | 101d |
| 6-15m Shielding - On Site | 05-Oct-10 | 05-Oct-10 | 0% | 101d |
| **1.05.04 Installation and Testing** | 06-Oct-10 | 29-Apr-11 | | 101d |
| Install Remaining 6-15m Shielding | 06-Oct-10 | 02-Nov-10 | 0% | 101d |
| Install 15-33m Shielding | 03-Nov-10 | 02-Dec-10 | 0% | 101d |
| Install Chopper Box B Base Shielding | 03-Dec-10 | 16-Dec-10 | 0% | 101d |
| Install Shielding Drum | 17-Dec-10 | 25-Jan-11 | 0% | 101d |
| Install Focusing Crystals Translating Mechanism | 26-Jan-11 | 31-Jan-11 | 0% | 101d |
| Install Chopper Box B | 01-Feb-11 | 08-Feb-11 | 0% | 101d |
| Install D/S Vacuum Window | 09-Feb-11 | 10-Feb-11 | 0% | 101d |
| Install Beamguide 4 | 11-Feb-11 | 17-Feb-11 | 0% | 101d |
| Install Drum Shield Shutter | 18-Feb-11 | 24-Feb-11 | 0% | 101d |
| Install Drum Shield to Sample Arm | 25-Feb-11 | 10-Mar-11 | 0% | 101d |
| Install Sample Table | 11-Mar-11 | 17-Mar-11 | 0% | 101d |
| Install Detector Vessel | 18-Mar-11 | 14-Apr-11 | 0% | 101d |
| Install Detector Vessel Enclosure Shielding | 15-Apr-11 | 21-Apr-11 | 0% | 101d |
| Install Interlock System | 25-Apr-11 | 29-Apr-11 | 0% | 101d |




Driven by BA profile & need to procure long lead items – building, drum shield, polarizing crystals

# Overview of HYSPEC Beamline



# Major Milestones on Track

**WBS 1.5 Hybrid Polarized Beam Spectrometer - HYSPEC - BL 14b**

| *MS ID* | *Milestone Description* | *Forecast* | *PEP* | |
|---|---|---|---|---|
| 1.5-1 | Core Vessel Insert - On Site | Nov-05 | Nov-05 | ✓ |
| 1.5-2 | Internal Design Review for Primary Beam System | Jul-06 | Aug-06 | ✓ |
| 1.5-3 | Design Review Drum Shield System | Jun-07 | Sep-07 | |
| 1.5-4 | Integrated Design Review | Aug-08 | Dec-08 | |
| 1.5-5 | External Building - Ready for Equipment Installatio | Aug-09 | Dec-09 | |
| 1.5-6 | Award Option - Shielding Drum | Sep-09 | Mar-10 | |
| 1.5-7 | Non-Polarizing Focusing Crystals - On Site | May-10 | Oct-10 | |
| 1.5-8 | Detector Vessel - On Site | Aug-10 | Jan-11 | |
| 1.5-9 | LPSDs - On Site | Nov-10 | Apr-11 | |
| 1.5-10 | CD-4e | Mar-11 | Sep-11 | |

- Core Vessel Insert – On-site & installed before SNS CD-4

- Design of the Primary Beamline System
  - Choppers T0, T1A & T1B disk choppers, T2 Fermi choppers
  - Beamguides & vacuum jackets/chopper boxes
  - Shutter insert

# Risks and Concerns

- Value of US$ - foreign currency purchases ~ $2.5M
- Schedule compatibility with BL15 (NSE) & BL14A
- Schedule compatibility with SNS operations
- Cost of drum shield
- Cost of external building

# Key Activities in Next 6 Months

- External building requirements specification
- Procure polarizing (Heusler) crystals [Long lead time]
- Shielding designs (within target building) [ 6-15m, 15-33m]
- Drum shield & chopper box B shielding designs

# Response to Previous Reviews

- **Recommend approval of CD-2 based on proposed cost, schedule, and technical baselines.**

  CD-2 for HYSPEC was approved on 10/24/05

- **Ensure that scientific advice from the IDT continues to be incorporated in any decision processes that impact instrument scope through the remainder of the project.**

  Weekly teleconferences are held with the HYSPEC PI's to discuss progress. Meetings are held with the IDT Executive Committee on a 4 to 6 monthly basis and a full meeting of the IDT on a yearly basis. A full meeting of the IDT was most recently held on April 16th - 17th, 2006, at which the full IDT considered the choices for a polarization analyzer for HYSPEC.

# Response to Previous Reviews

- **“ Project should consider holding a workshop on polarized neutron technology to assess prospect of the development of 3He polarization technology suitable for HYSPEC.”**

PINS (Polarized Inelastic Neutron Scattering) Workshop + IDT Meeting
April 6th & 7th Brookhaven National Lab.

Speakers from US, Japan, France, Switzerland, Australia

Topics: Science, $^3$He, Supermirrors, Heusler, New Instruments

IDT voted in favor of PSI joining IDT + contributing supermirror pol. analyzer.

IDT voted in favor of including $^3$He pol. analyzer to extend capabilities

# Hazards Analysis

| Type | Presence | Unmitigated Level | Mitigation | Mitigated Level |
|---|---|---|---|---|
| Chemical | Possible during operations; NA during fabrication | Low | OSHA standards, training and experimental safety reviews | Extremely Low |
| Cryogenic | Possible during operations; NA during fabrication | Low | Safety Training for Cryogenic Operations will be required | Extremely Low |
| Electrical | Common Industrial less than 240 VAC | Low | SNS Electrical Safety committee and following extensive LOTO procedures | Extremely Low |
| Fire | Routine; limited combustible shielding | Extremely Low | Any combustible materials will be enclosed; fire protection system | Extremely Low |
| Magnetic Field | Possible during operations around the sample station; fringe field from Heusler polarizer or supermirror analyzer | Extremely Low | Experiments will follow the magnetic field policy for the SNS | Extremely Low |
| Mechancial | Choppers; equipment lifts; movement of detector vessel | Low | SNS Instrument Safety Committee review of chopper design and analysis; critical lift procedures; detector vessel speed < 6 inches/s | Extremely Low |
| Oxygen Deficiency | Detector vessel contains Ar gas, possible leakage | Extremely Low | No routine access; lock-out procedures will be in place; monitoring devices will be used | Extremely Low |
| Prompt Radiation | Worker accesses detector area without secondary shutter closed | High | PPS interlocks, Beam cut off; also training and warning lights | Low |
| Background Radiation | Exposure from HYSPEC or neighboring instruments | Low | All external surfaces will be surveyed for compliance to the 0.25 mrem/hr requirement | Extremely Low |
| Vacuum and pressure | Loss of vacuum in guide system | Extremely Low | Guides are contained within steel jacket and beam line shielding | Extremely Low |
| | Pressurized 3He filter cell | Medium | Design shield for use when personnel access area of pressurized cell. ORNL safety reviews & training. | Extremely Low |

# Ready for CD-3

| Task/Milestone | Date |
|---|---|
| CD-0 (Approve Mission Need) | 5/03 ✓ |
| CD-1 (Approve Preliminary Baseline Range) | 4/04 ✓ |
| CD-2 for (Instrument) (Approve Performance Baseline) | 10/05 ✓ |
| SING MIE Project Hazards Analysis updated | *8/06* ✓ |
| IPR ( DOE-SC review) | *8/06* ✓ |
| Updated Project Execution Plan | *8/06* ✓ |

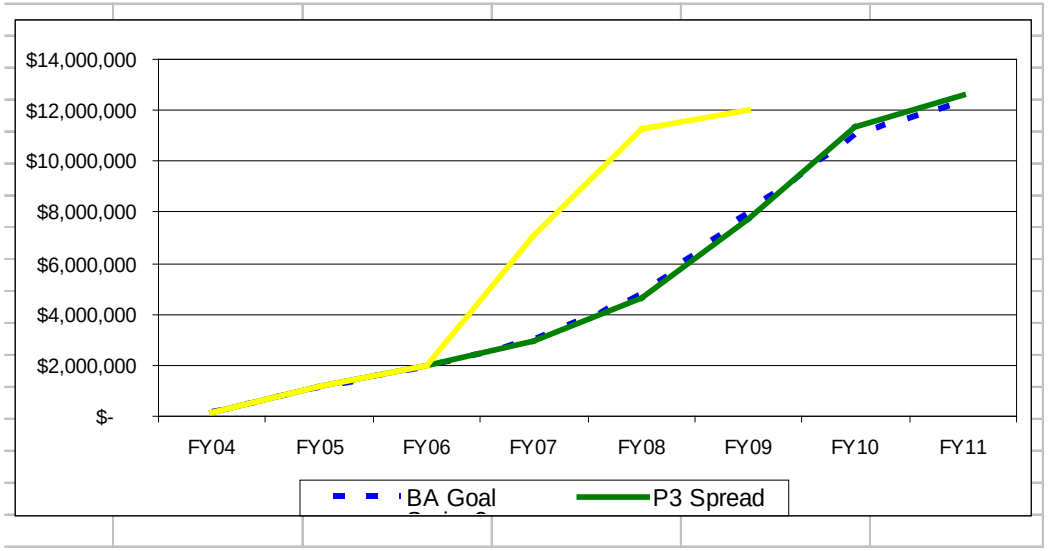
<u>Design completed</u>

- Choppers + chopper boxes
- Guides [1a, 1b, 1c, 2 & 4]
- Shutter insert
- Focusing crystals
- External building
- {Dec 06} Shielding [6-15m, 15-33m]
  [Total = $4.76M out of $8.9M]

<u>Procurements Scheduled</u>

- T0 chopper
- Polarizing crystals (1st phase)

# Acceleration Plan




| FY07 | FY08 | FY09 | FY10 | FY11 |
|---|---|---|---|---|
| +$4.11M | +$2.53M | -$2.53M | -$3.05M | -$1.26M |

Finish date = Sep-09 + 6-months float = Feb-10

- No change to design (slight re-ordering), but don't wait for BA
- External building has to be ~1 year earlier than planned

# Summary

- HYSPEC is on-track with budget & schedule
- HYSPEC is attracting inward investment (PSI joining the IDT) which is expanding the capabilities of HYSPEC
- By end of calendar 2006 will have $4.7M worth of procurements ready
- With an appropriate acceleration in BA HYSPEC can be completed in late 2009