

IPNS-I

Status of IPNS Construction

N.J. Swanson, Argonne National Laboratory

Progress in all areas of the design and construction indicates high confidence that the IPNS-I facilities will become operational in April 1981. With the shutdown of ZING-P' program in August 1980 additional resources have been released to work on the transition from the prototype facility to the where prototype operations did not allow construction work previously. Details of the progress for the three principal tasks of the IPNS-I projects are given below.

Proton Transport System (PTS)

The PTS tunnel was completed within the experiment hall (Building 375) and expanded to the limit of its support pad outside and north of the hall. Included has been the completion of the proton beam dump which will serve as a Faraday Cup to accept the full output of the accelerator for operational optimization purposes.

The PTS magnets obtained from ZGS have been refurbished and mounted on newly-procured precision positioning platforms which will also serve as mobile transport dollies for installation or removal from the PTS tunnel. Several magnets have been positioned in the completed tunnel and the alignment and vacuum system testing has been started.

With the completion of ZING-P' prototype operations preparations for joining of the PTS tunnel to the synchrotron cavity were begun. This work included removal of accelerator shielding blocks of the south side, excavation of the floor and earth at the cavity-tunnel junction area, placement of the extension of the high-load concrete support pad for the PTS shielding, and the relocation of accelerator power supplies and miscellaneous equipment

previously located at the junction zone. Joining of the PTS tunnel to the accelerator cavity is planned for completion before the inclement winter weather arrives.

Progress is quite satisfactory for the ancillary systems to support the PTS. This work includes the subsystems for beam diagnostics, vacuum, beam control and safety shutdown. Accelerator modifications have been started to modify and relocate the extraction system. These activities are scheduled to be completed at the time when the PTS construction will be finished in February 1981.

Neutron Generation System (NGS)

The slow, tedious task of cutting and fitting of the shielding steel around the vessels and neutron beam tubes within the atmospheric control barrier has been completed. Design of the removable shielding to be used within the vessels and neutron beam tubes is complete and procurements have begun.

Fabrication of the components for the first target is progressing on schedule. Assembly of some of these components to form the first target will be performed in October with preoperational testing begun in November. Delivery of the target cooling systems is expected in early October with installation performed shortly thereafter. Mating of these systems to target assemblies is expected in November.

The beryllium reflector assembly and its contained moderator cans for the Neutron Scattering Facility is being fabricated. Delivery of this long lead item is not expected until late January and this work continues to comprise the critical path for the overall construction. The reflector assemblies for the Radiation Effects Facility are being fabricated with delivery expected in October.

Design of all electrical and mechanical facility systems for support of the NGS has been completed. All procurements are underway and installations were begun in September.

All designs for the NGS monitoring and control systems have been completed. All procurements have been placed and most have been received. Installation in the control room, now under construction, is expected to begin in late October.

#### Instruments and Data Acquisition System (DAS)

It is planned that seven neutron scattering instruments will be operational during 1981. Designs were completed for the flight paths of the Special Environment Powder Diffractometer and General Purpose Powder Diffractometer. Bid solicitation for these components was completed and a fabricator selected. Work continues on developing layouts for the High Resolution Medium Energy Chopper Spectrometer scattered flight path housing. This assembly will be obtained by a design and build contract.

Conceptual designs for the Crystal Analyzer Spectrometer and Small Angle Diffractometer are continuing. Detail design work for the Low-Resolution Medium-Energy Spectrometer and Single Crystal Diffractometer will begin shortly.

Progress has been realized in the development for single-ended, linear position-sensitive detectors needed for the two powder diffractometers. Suitable detector systems are expected at the time when the housings are ready to accept them.

Work has begun on the rebuilding and refurbishment of vacuum systems required for the scattering instruments. Most of the vacuum equipment will derive from existing components obtained from completed HEP programs.

Designs for the five required choppers has been completed. A fabricator has begun the machining of the beryllium parts and ordering of other chopper components has been started.

For the DAS activities work continues on the detail design for detector electronics, computer software and computer hardware. A fifth front end computer has been delivered. One computer is being used for program development and detector electronics checkout.

The progress on developing encoding circuits for single-ended linear position-sensitive detectors has been excellent. Close coordination with the detector supplier continues in an effort to optimize the special detector needs for IPNS-I instruments.

#### General Items

At the beginning of August the contractor who began the IPNS-I construction work was dismissed and replaced by a new, inexperienced contractor. Since this action occurred with very short notice, all active subcontracts became invalid and required formalization with the new contractor. This caused some delays while new subcontracts were established. Also, some inefficiencies were encountered due to the changing of supervision. At present most problems had been remedied and harmonious and efficient construction activities appear to have been restored. High rainfall in August and early September caused some delays. However, exceptionally good weather in October has permitted acceleration of the construction activities.

The operation staff for IPNS-I have coordinated the development of the Safety Analysis Report (SAR). This report has been reviewed by committees with information participation by design personnel. The reviews have resulted

in some design improvements. The SAR has been approved by the Laboratory committees and will now be submitted to the Department of Energy (DOE) for approval. With the DOE approval of the SAR on schedule, startup of the facility in April 1981 can be expected.