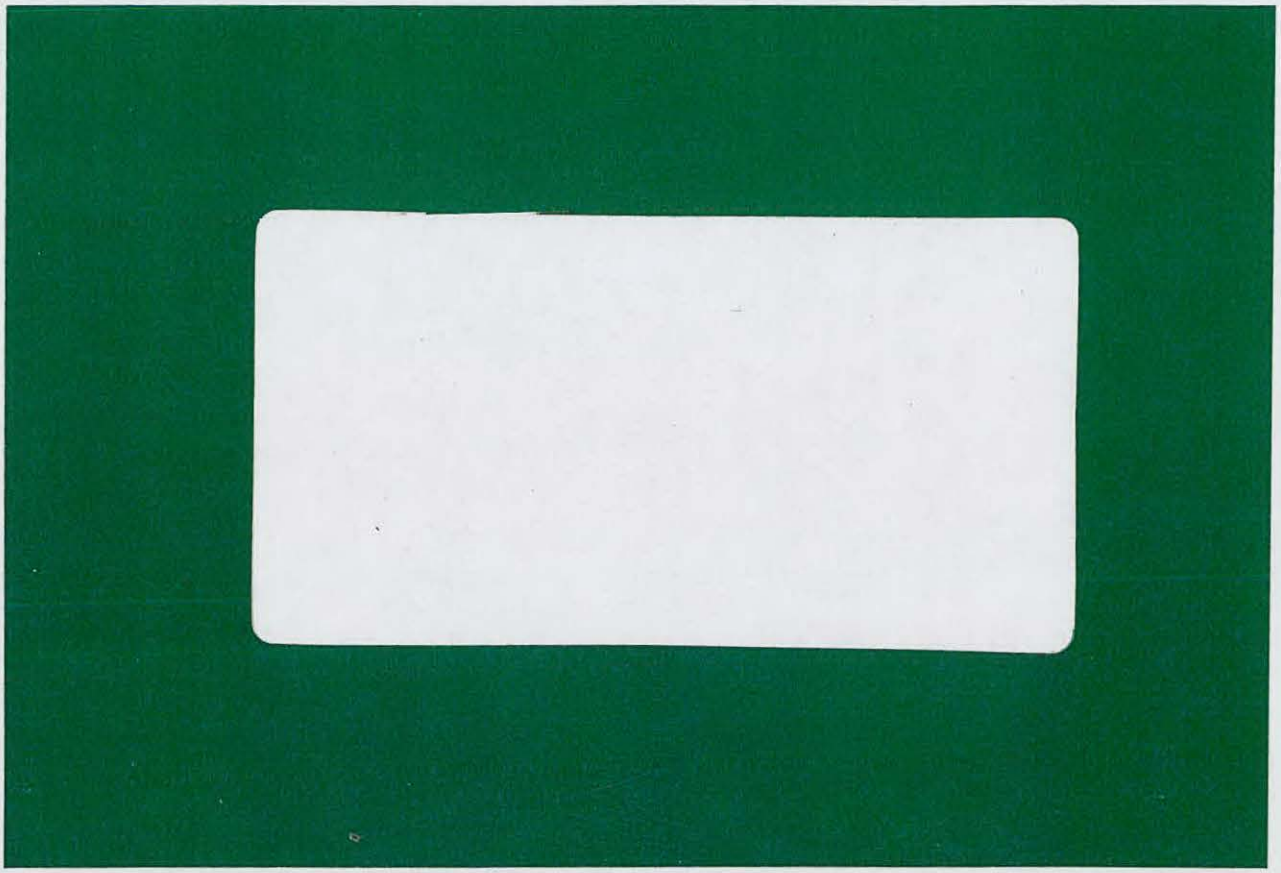

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ADVANCED ACCESS CONTROL SYSTEM

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ADVANCED ACCESS CONTROL SYSTEM

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ABSTRACT

A prototype voice verification system has been installed which provides the required positive identification at the main site access control point. This system compares an individual's file voice print with a sample voice print obtained from the individual when an attempt is made to enter the site. The voice system transmits the individual's identity to a central processor.

The central processor associates that individual's authorization file with a card-key obtained at the access point. The system generates a record of personnel movement, provides a personnel inventory on a real-time basis, and it can retrieve a record of all prior events. The system installed at the Barnwell Nuclear Fuel Plant is described.

ADVANCED ACCESS CONTROL SYSTEM

An Advanced Access Control System is being developed and demonstrated at the Barnwell Nuclear Fuel Plant under contract to the Department of Energy. This Access Control System is based on commercially available hardware wherever possible; however, prototype or developmental hardware was applied, where necessary, to meet the access control concept requirements.

The necessity of controlling and recording the movement of personnel within the facility has made automated identification and documentation of personnel movement a critical component of all Advanced Safeguards Systems. The personnel identification and documentation portions of AGNS' Advanced Access Control System consist of two major components: (1) the positive personnel identification and (2) a card-key control point hardware/software system, along with a personnel inventory/authorization system.

Positive Personnel Identification

The developmental Positive Identification System requirements were: (1) rapid personnel processing, (2) accuracy of identification, and (3) compatibility with installation at all locations within a nuclear facility. To meet the developmental objectives, a prototype Voice Verification Access Control (VVAC) system was selected. The voice verification prototype was obtained from Texas Instruments, Inc., Dallas, Texas. The voice verification system verifies the individual's identity by comparison of a reference file voice print with a voice print sample obtained at the access control point. The technology used in this system has been under development by Texas Instruments and others for several years. The voice verification system computer transmits the verified individual's employee number to the card-key system computer for access authorization processing. The installed system is shown in Figure 1, and the layout of the Industrial Security Gate House is shown in Figure 2. The basic system and the relationship between the VVAC and Access Control System is shown in Figure 3.

Card-Key Access Control

The developmental card-key hardware selection criteria were: (1) rapid personnel processing, (2) accurate and repeatable card-key signals, and (3) compatibility with installation at all locations within a nuclear facility. To meet the developmental objectives, the Schlage Electronics, Inc., Proximity Card-Key System was selected. The proximity cards may be read through several layers of clothing and the user does not have to handle the card to insert it into a reader as with other electronic card-key types. The access control data base contains extensive information about the areas, the status of the areas, the conditional access requirements, and the individual's access authority. This data base is used by the access control software

to provide personnel movement control, access event documentation, and a real-time personnel inventory. The access control system has been developed utilizing two DEC-PDP 11/34 minicomputers.

The card-key is selected at random and registered to the user on entry into the Industrial Site. The Central Processing Unit associates the card-key with an access authorization file for the employee identified by the voice verification computer. The card-key then identifies the specific individual at all interior control points. Each access request, initiated by presentation of the card-key to a sensor, results in a computer search of the individual's access authorization file and the area status file before access is granted. The computer, thereby, verifies the individual's authority and the acceptable status of the area before permitting access.

The card-key remains associated with a specific individual until it is relinquished on exit from the Industrial Site Boundary. The association of the individual with another randomly selected card-key must be re-established by voice verification for each entry through the Industrial Site Boundary. The card-key associated with the individual is valid only for the time period the individual is inside the controlled area.

The concept has been developed and is implemented in a test bed at the BNFP for an area containing examples of typical nuclear facility control points. The demonstration system consists of access controls at the Industrial Security Area, the Protected Area, Vital Areas, and Material Access Areas, The Industrial Security Area boundary contains all the site manufacturing and support facilities. The Protected Area encompasses the main process building and the crucial support facilities. Those support facilities which contain vital equipment are inside Vital Area control boundaries within the Protected Area. The Material Access Areas of the facility are also surrounded by access control boundaries. Passage through the material access boundaries requires the highest level of physical security. At least one example of each of the control point types has been incorporated into the AGNS test bed. Examples of the test bed control points are shown in Figures 5 through 8. The boundaries of the test bed control areas are shown in the diagram in Figure 4. Full implementation of the AGNS access control concept is anticipated to require at least three times the number of control points that are currently in the test bed system.

The voice verification and card-key system, when integrated with routine physical security force procedures and equipment, presents a formidable system to potential adversaries as well as providing full documentation of all personnel movement. The system enables Operations, Safety, and Security to locate specific individuals or display real-time personnel inventories for areas within the controlled portion of the facility.

The integrated system requires that the automated access control as well as the manned physical security equipment be defeated before a covert adversary action could be successful.

Extensive tests to date indicate that the system provides effective control and documentation as required, without causing unacceptable delays in the routine operation of the facility.

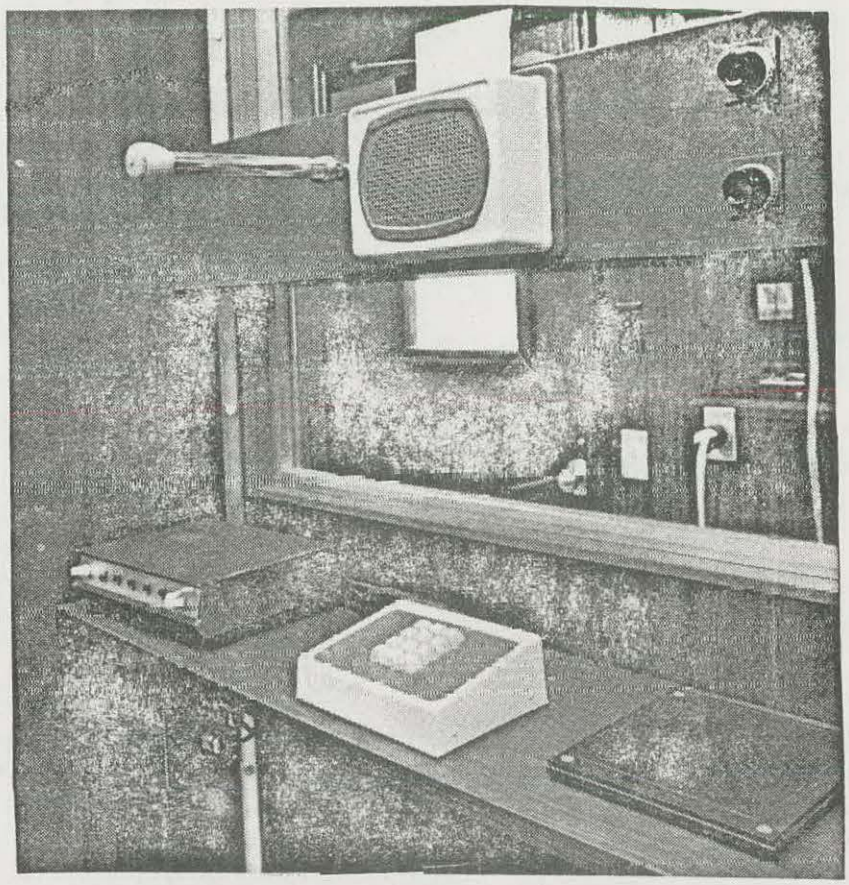

Figure 1. Voice Verification Entrance Control Point

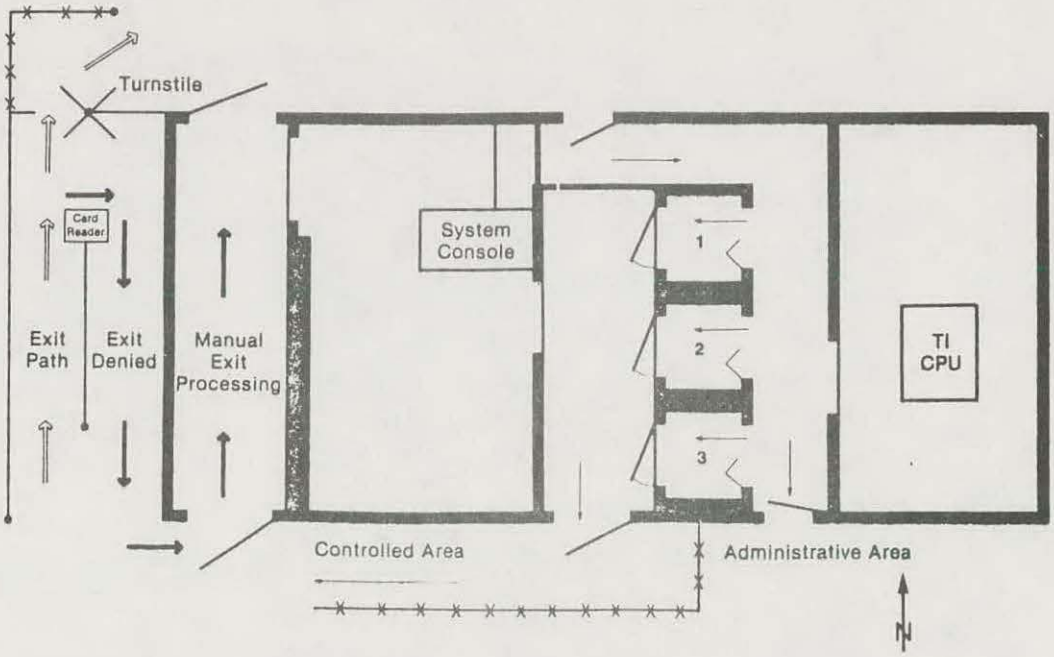

Figure 2. Industrial Security Gatehouse Arrangement

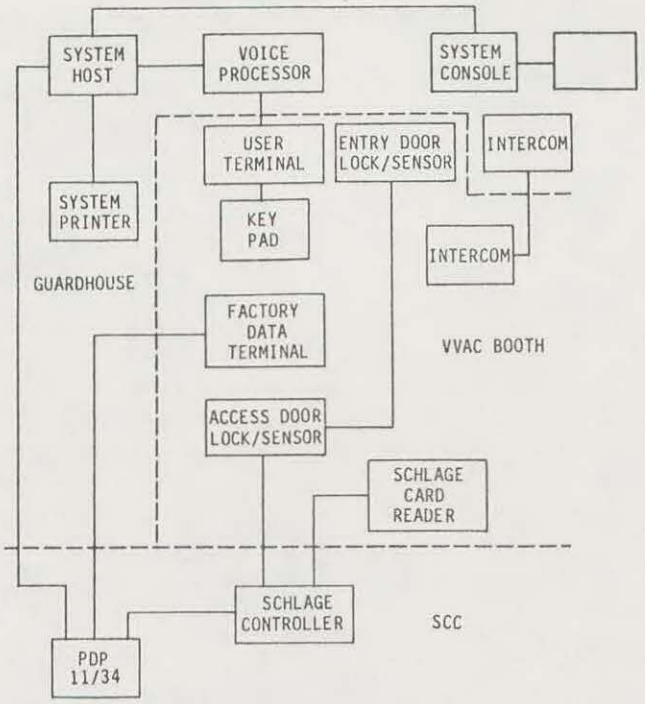

Figure 3. Typical VVAC Booth Hardware Interconnection

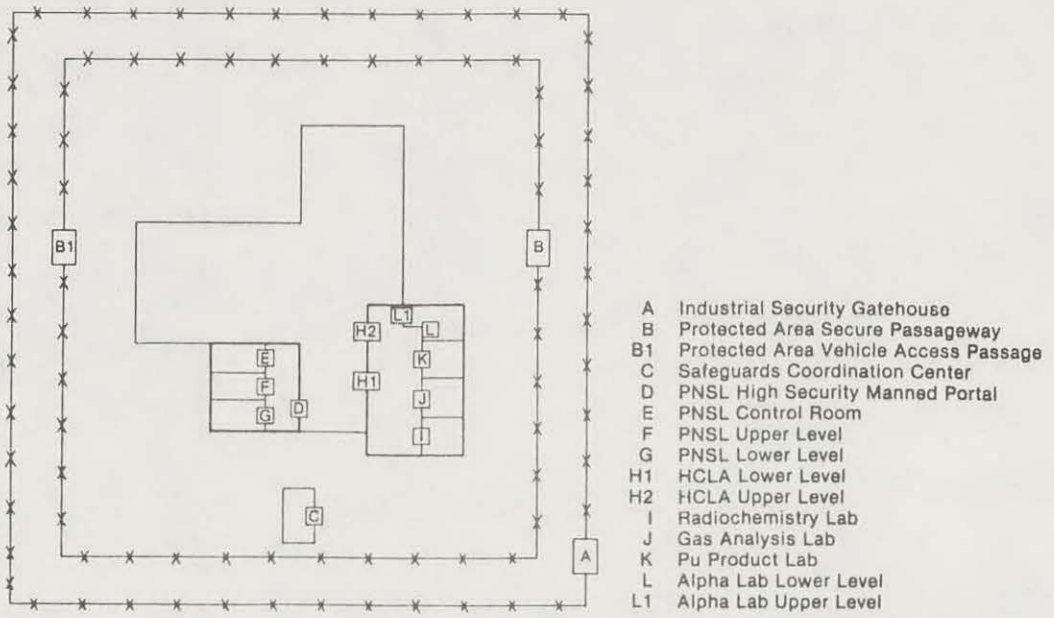

Figure 4. Major Access Control Demonstration Areas

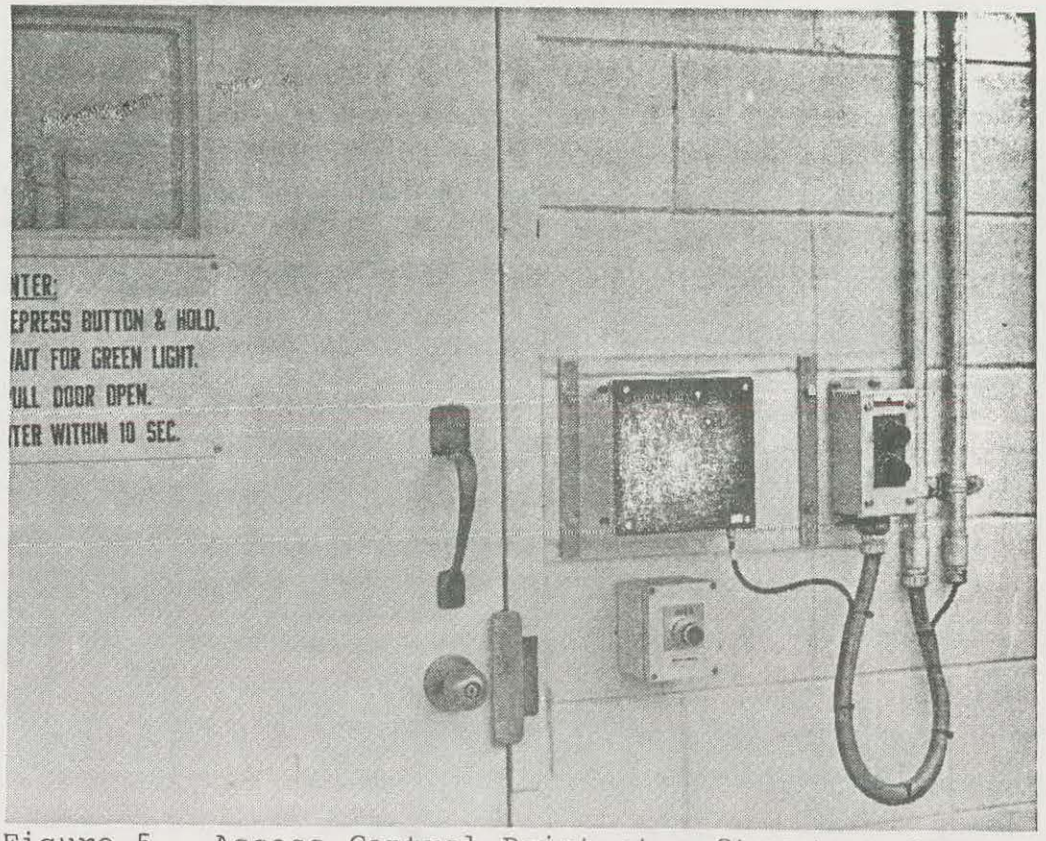

Figure 5. Access Control Point at a Structure Doorway

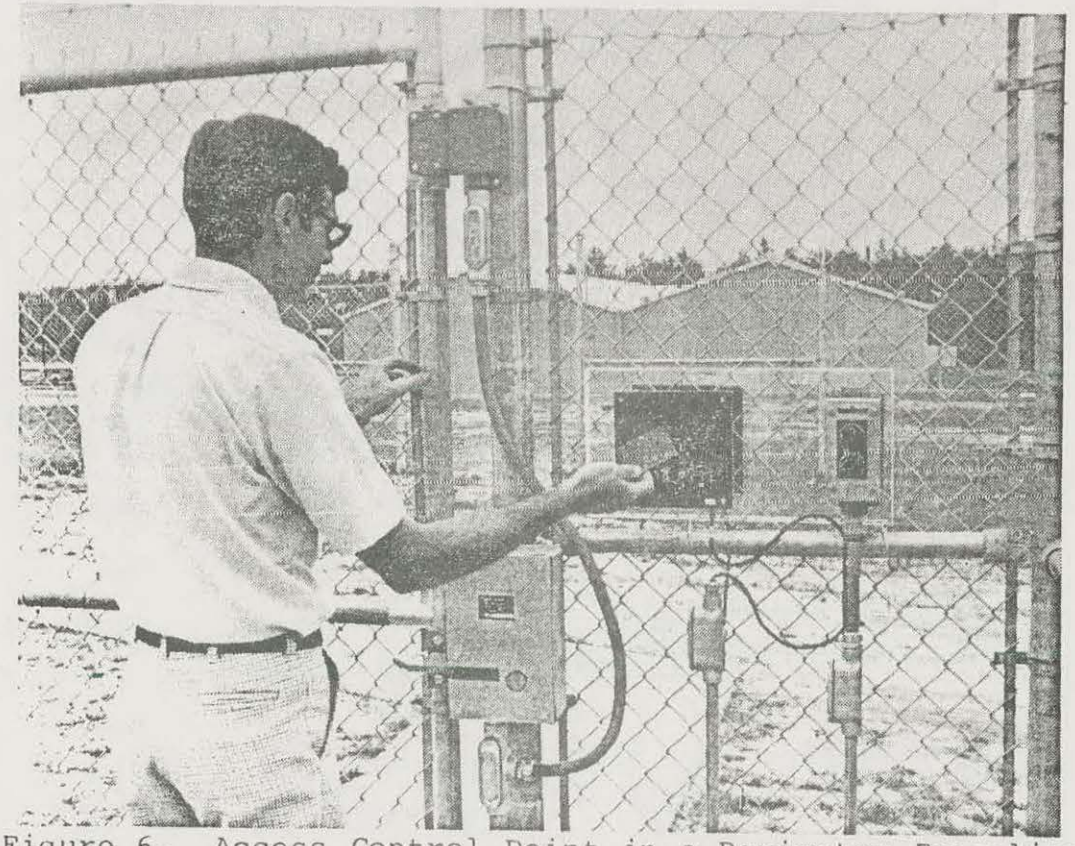

Figure 6. Access Control Point in a Perimeter Fenceline

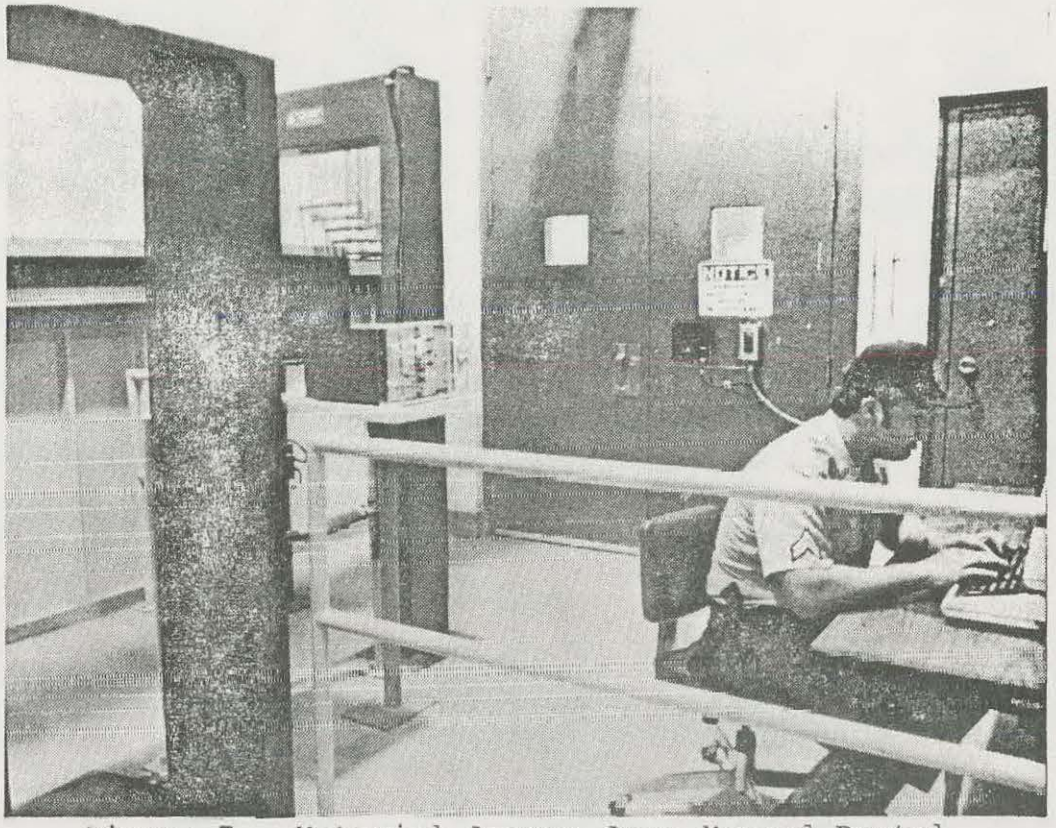

Figure 7. Material Access Area Manned Portal

Figure 8. Industrial Security Area Exit Turnstile

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