Alabama Power

the southern electric system

P. O. Drawer 470
Ashford, AL 36312
March 24, 1980
FNP-80-0307

Mr. John F. Burdoin
Division of Operating Reactors
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Burdoin:

As requested by you during the APC-NRC Lesson's Learned meeting of February 29, 1980, I am enclosing for your use additional information on the FNP Compressed Air System. Attached is the FSAR description of the Compressed Air System and a P & ID showing the air compressors, air receivers and instrument air dryers.

As stated in the meeting, the FNP Unit 1 air compressors are supplied from Normal 600V Load Centers as follows:

Air compressor 1A from 600V Load Center 1G
Air compressors 1B and 1D from 600V Load Center 1P
Air compressor 1C from 600V Load Center 1Q

Upon unit trip with LOSP, Air Compressor 1A can be supplied with emergency power from 4160V Bus 1H through Station Service Transformer 1G. This action is accomplished manually from the control room. Air Compressor 1C or Air Compressors 1B and 1D can also be supplied with emergency power through 600V load center 1F. This action is accomplished by manual key interlocked breaker operations in the Auxiliary Building on elevation 121' and the Turbine Building on elevation 155' and is estimated to required no more than 10 - 15 minutes.

Please let me know if I can be of further assistance.

Yours truly,

Kenneth W. McCracken

Kenneth W. McCracken
Technical Superintendent

KWM:kwl

Enclosure

cc: O. D. Kingsley, Jr.
File

A039
S
1/1

8004010372

9.3 PROCESS AUXILIARIES

The Process Auxiliaries consist of those auxiliary systems associated with the Reactor Process System. These systems include the Compressed Air System, Process Sampling Systems, Equipment and Floor Drainage System, Chemical and Volume Control System (CVCS), and Failed Fuel Detection Systems. The evaluations of radiological considerations are presented in Chapter 12.0. Only the CVCS is necessary for safe shutdown of the plant.

9.3.1 COMPRESSED AIR SYSTEM

The Compressed Air System, as shown in Figure 9.3-1, provides all plant compressed air requirements for pneumatic instruments and valves and for service air outlets located throughout the plant. The Compressed Air System is not required for the safe shutdown of the plant. The following subdivisions provide information on: a, design bases; b, system descriptions; c, safety evaluation; d, tests and inspections; and e, instrumentation applications for the Compressed Air System. The following description is for one unit: there is one spare compressor train installed with Unit 1 which is arranged so that it may be used for either unit.

The second unit is identical except for the spare compressor.

9.3.1.1 Design Bases

Each of four air compressors provided in the system is sized to furnish the total average instrument air requirements plus an allowance for service air use. Each of the two trains of instrument air filtering and drying components provided is sized to treat the normal maximum quantity of air required for instrument air requirements and to deliver dry air having a dewpoint of -40 F or less at 100 psig.

The compressed air piping system which furnishes air inside the containment is equipped with containment isolation valving in accordance with the criteria for Containment Isolation Systems as discussed in Section 6.2.4.

All parts of the system located within the auxiliary building and containment, with the exception of the containment penetrations, are designed to meet seismic Category II requirements. The air receivers and instrument air dryers were designed and fabricated in accordance with Section VIII of the ASME Boiler and Pressure Vessel Code. System piping, with the exception of the containment penetrations, was fabricated and installed in accordance with ANSI B31.1, Code for Pressure Piping. The containment penetration piping was fabricated and installed in accordance with Section III of the ASME Boiler and Pressure Vessel Code.

9.3.1.2 System Description

The Instrument and Service Air System consists of the four compressors, four aftercoolers, four air receivers, and instrument air filtering and drying equipment. The cooling water for aftercoolers and compressors is supplied from the Service Water System. The air receivers are connected to a common compressed air header which branches into one instrument air header and one service air header.

Each air header supplies branch lines which supply instrument air and service air to all parts of the plant. All instrument air lines penetrating the containment have isolation valves located outside the containment which are installed in series with check valves located inside the containment. All service air lines penetrating the containment have one locked closed globe valve on both sides of the containment penetration.

The four identical compressors are double-acting, two stage, water-cooled, and V-belt driven. Each of the compressors is rated to deliver 550 scfm at 100 psig discharge pressure. Each compressor takes suction from inside the Turbine Building through an air filter. Each compressor train is equipped with an aftercooler and moisture separator and a 150 ft^3 capacity air receiver tank.

The compressor controls are designed to permit continuous operation of any number of the compressor motors with the compressors automatically loaded and unloaded in response to system pressure or automatic start and stop operation of any number of the compressor motors in response to system pressure. During normal plant operation, one of the compressors is selected for continuous motor operation while the other compressors serve as standbys and start automatically if the continuously operating compressor cannot meet system demand. Startup of a standby compressor is annunciated in the control room.

Compressed air for instrument air use passes through one of the two parallel instrument air filtering and drying trains before being distributed to the instrument air piping system. Each train is equipped with one prefilter, an air dryer assembly, and one afterfilter connected in series. The arrangement of the filtering and drying equipment allows cleaning or changing of filters while the unit is in operation by diverting the air flow through the other parallel train. Each air dryer has two independent drying chambers connected in parallel. The air dryer automatically alternates flow of air through each of the chambers to permit automatic drying of the desiccant in one chamber while the other chamber is in service.

9.3.1.3 Safety Evaluation

The Compressed Air System is required for normal operation and startup of the plant; however, all pneumatically operated devices in the plant essential for safe shutdown are designed to operate to the safe position upon loss of air pressure. Therefore, a supply of compressed air is not essential for safe shutdown of the plant and the Compressed Air System is, accordingly, not designed to meet the single failure criterion. All pneumatically operated valves essential for safe shutdown are listed in Table 9.3-7. Those valves necessary for containment isolation are listed in Table 6.2-19. 34

The isolation valves installed in the instrument air containment penetrations will prevent releases from the containment in the event of failure of the Compressed Air System pressure boundary inside the containment. The air-operated isolation valves automatically operate to the closed position upon initation of a containment isolation signal and are designed to operate to the closed position upon failure of air pressure or electrical power to the valves.

Required air cleanliness is maintained by the following features:

1. Filters installed at the inlets to the compressors.

2. Filters at each end of the air dryer elements. The afterfilters are designed to remove particulates down to five microns in size.

3. Filters installed in all lines to instruments and valves.

The compressors and the air dryer unit are designed for full capacity operation over the full range of environmental temperature and humidity conditions that can occur in the Turbine Building.

9.3.1.4 Tests and Inspections

The Compressed Air System will be tested in accordance with written procedures during the initial testing and operation program. All Engineered Safety Features Systems will be tested for performance capability under conditions of loss-of-instrument air as outlined in Chapter 14.0.

9.3.1.5 Instrumentation Applications

Each air compressor is furnished with a compressor control unit. This control unit loads the compressor at 90 psig and unloads at 100 psig. When placed in the constant speed position, it automatically starts and stops the compressor at these same pressures when placed in the automatic position.

The following pressure switches are provided downstream of the air receivers:

SWITCH	ACTUATION POINT	FUNCTION
N1P19S901	80 psig Manual reset	Closes N1P19V901, isolating service air header.
N1P19S902	70 psig Manual reset	Opens N1P19V902, By-passes air dryers and filters.
N1P19S904	55 psig Manual reset	Closes N1P19V904, isolating non-essential air header.
N1P19S903	45 psig Manual reset	Closes N1P19V903, isolating essential air header.