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CLASS: <u>U</u> PROP INFO	INPUT	NO CYS REC'D 1	DOCKET NO: 50-305			
DESCRIPTION: Ltr re our 11-3-72 oral request, trans the following:  NOTE: DIST PER M. SERVICE  PLANT NAMES: Kewaunee			ENCLOSURES: REPORT: Preliminary Response to AEC-DOL Staff Oral Questions of 11-3-72  ( 1 cy of encl rec'd )			

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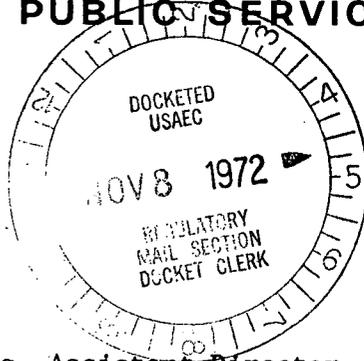
1-LOCAL PDR Kewaunee, Wis	(1)(5)(9)-NATIONAL LAB'S	1-PDR-SAN/LA/NY
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WOODWARD/H. ST.	NEWMARK/BLUME/AGABIAN	Rm C-427, GT)
16-CYS ACRS HOLDING		1-RD...MULLER...F-309GT

## WISCONSIN PUBLIC SERVICE CORPORATION

Public Service

P.O. Box 1200, Green Bay, Wisconsin 54305

November 7, 1972



Mr. R. C. DeYoung, Assistant Director  
for Pressurized Water Reactors  
Directorate of Reactor Licensing  
United States Atomic Energy Commission  
Washington, D.C. 20545

Dear Mr. DeYoung:

KEWAUNEE NUCLEAR POWER PLANT  
AEC DOCKET 50-305

On November 3, 1972, we received your oral request to provide additional data on the steam lines and other lines carrying fluids at high energy. We understand you are interested in information about our approach to design with regard to the postulated failure of these high energy piping systems (combined pressure and temperature) in the Auxiliary Building. In the short time available to us we have principally concentrated on providing additional information about the design of these systems, their location in the buildings and the consequences of the ruptures considered in design. We are attaching this preliminary informational response entitled "Preliminary Response to AEC-DOL Staff Oral Questions of November 3, 1972."

The data presented in this response includes our evaluation, as an accident basis, of a single ended rupture of a branch line or header nozzle to a safety valve, relief valve, or dump valve. The largest of these lines is an 8-inch line. We also are providing in the response technical data supporting our selection of this type failure as the accident basis.

In your request, you have asked us to review the design considering a hypothetical double-ended rupture of a main steam line. As we see it, the AEC criteria only apply the hypothetical assumption of a double-ended break to a loss-of-coolant accident but not to other systems. We are of the opinion that the quality of design and installation employed in the Kewaunee Plant precludes the occurrence of such a failure. In the time available to us since your request we have not been able to complete any suitable studies considering a hypothetical double-ended rupture. If you need the results of such studies for your continued review we would require additional time to complete them and submit another informational report.

Very truly yours,

*E. W. James by C. W. Giesler*

E. W. James, Senior Vice President -  
Power Generation and Engineering

6122

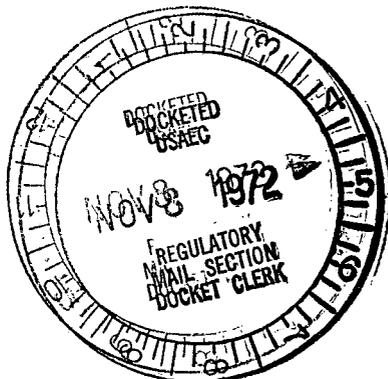
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WISCONSIN PUBLIC SERVICE CORPORATION  
KEWAUNEE NUCLEAR POWER PLANT  
AEC DOCKET 50-305

PRELIMINARY RESPONSE  
TO  
AEC-DOL STAFF ORAL  
QUESTIONS OF NOVEMBER 3, 1972

November 7, 1972



PRELIMINARY RESPONSE

TO

AEC-DOL STAFF ORAL

QUESTIONS OF NOVEMBER 3, 1972

- I. Description of High Energy Systems
  - A. Main Steam
  - B. Feedwater
  
- II. Description of Structures
  - A. Potentially Affected Structures
  - B. Structural Capability of Area Walls and Floors
  
- III. Discussion of Analyses and Results (8-Inch)
  - A. Building Pressures
  - B. Building Temperatures
  - C. Pipe Whip Effects
  - D. Jet Force or Impingement Effects
  - E. Environmental Effects of Infiltration of Steam
  - F. Description of Functions Required During and Following the Accident
  - G. Re-Entry to Auxiliary Building Following Steam Line Rupture
  
- IV. Miscellaneous Piping System Analyses

## SECTION I

### DESCRIPTION OF HIGH ENERGY SYSTEMS OUTSIDE OF CONTAINMENT

#### A. Main Steam

The Main Steam lines are generally described in Section 10.2.2 of the Kewaunee FSAR. This section will provide further descriptive information concerning the physical location aspects of the Main Steam lines and the controls exercised to assure that high quality standards were met. Each Main Steam line will be discussed in turn to describe physical location and a general discussion will follow on the quality control aspects which we believe justify the consideration of branch line failures only.

The 30 inch OD Main Steam line from steam generator 1A exits from containment at elevation 622'-0" into the northwest quadrant of the Auxiliary Building. The Main Steam safety valve header is located directly outside of the Shield Building, transverse to the Main Steam line header, and is 24 inches in diameter. The line continues through an elbow, which is axially restrained, to the Main Steam stop-check and check valve assembly, (isolation valves) and then turns easterly through another axially restrained elbow into the Main Steam restraint block. The line then rises upward into the operating floor area of the Auxiliary Building and continues in an easterly direction, running near the Shield Building, until it reaches the higher floor elevation of the Auxiliary Building. The line then travels northward for a short distance, again continues eastward through the Records Storage Room and enters the Turbine Building at an elevation of 652'-0". The line then goes directly down to the underside of the Turbine Room operating floor, continuing easterly, until it reaches the turbine stop valves located on the operating floor of the Turbine Building. This routing is shown on Figures 1.2-7, 1.2-8 and 1.2-10 of the Kewaunee FSAR.

The 30 inch OD Main Steam line from steam generator 1B exits from the containment at elevation 620'-0" into the east quadrant of the Auxiliary Building. The Main Steam safety valve header is located directly outside of the Shield Building, transverse to the Main Steam line header, and is 24 inches in diameter. The line continues directly eastward into the Main Steam stop-check and check valve assembly followed immediately by the Main Steam restraint block. The line then continues to run directly eastward, turns northerly and then penetrates into the Turbine Building below the Turbine Room operating floor, turns northerly again and then turns eastward to run parallel with the 1A Main Steam line before turning upward to the turbine stop valves located on the operating floor of the Turbine Building. This routing is shown on Figures 1.2-6 and 1.2-10 of the Kewaunee FSAR.

The 30 inch outside diameter Main Steam piping is ASTM A-155 Grade KC-70, Class 1, plate pipe which has been used repeatedly as pipe material for high temperature - high pressure service and in the fabrication of unfired pressure vessels for use within the power industry. The remainder of the Main Steam piping consists of A-106 Grade B, seamless pipe material. This is a pipe material which has been employed extensively in the power industry for many years.

In general, all materials, design, shop and field fabrication, erection and testing conforms to the requirements of the Code for Pressure Piping USAS-B31.1.0, 1967, and applicable requirements of the ASME Boiler and Pressure Vessel Code, ASTM and all state and local code requirements, latest editions in effect as of the date of the contract (August, 1969).

The entire length of the 30 inch OD Main Steam piping has been analyzed for thermal, seismic, (both O.B.E. and D.B.E.) and dead weight loads, and the stresses were combined in accordance with B31.1.0 - 1967, and applicable code cases. All stress analyses were independently reviewed, and verified.

It should be noted that ANSI Standard N18.2 requires main steam pipe to be Safety Class 2 up to and including the outermost containment isolation valve, whereas our analysis has extended this design requirement to the turbine stop valves.

There are five 6-inch by 10-inch code safety valves located on each of the two 30-inch main steam lines outside the reactor containment and upstream of the isolation and non-return valves. Discharge from these safety valves is carried to atmosphere through closed vent piping, i.e., there is no free jet discharge at the valve outlet elbow.

In addition, one 8-inch power-operated relief valve is provided in each main steam line which is capable of releasing the sensible and core decay heat to the atmosphere. Discharge from each power relief valve is carried to atmosphere through an individual vent stack which is connected directly to the valve outlet.

As a result of the main steam safety valves having a closed discharge, there are no large moments produced which must be carried into the safety valve header. Thus, under valve discharge conditions, all stresses are well within the allowables. Additionally, because of the closed discharge, there is no mechanism for separation of the valve discharge and the vent stack.

All analyses performed on the safety valve design have been independently reviewed and verified.

The quality control documentation obtained on the Main Steam System piping consists of the following:

1. Plate Material
  - a) certified chemical and physical test reports traceable to heat numbers
  - b) 100% ultrasonic inspection of plate material

2. Rolled and Welded Pipe and Fittings
  - a) Welding procedures and weld procedure qualifications
  - b) Welding operator qualifications
  - c) Welding rod certified test report
  - d) 100% radiography of longitudinal welds
  - e) 100% magnetic particle inspection of longitudinal welds
  - f) Identification of welds, by weld number, and traceability to weld operators, weld rod materials, film numbers and MT reports to actual weld.
  - g) Normalizing treatment temperature recording charts (plate pipe only)
  - h) Hydrostatic test of each length of pipe
  - i) Photomicrographs from one end of each two lengths (plate pipe only)
3. Fabricated Pipe - 2a, 2b, 2c, 2f above plus
  - a) 100% radiography of all butt welds
  - b) 100% magnetic particle inspection of all socket, fillet and nozzle welds
  - c) Pre-heat and stress relieving temperature recorder charts
4. Erected Pipe - 2a, 2b, 2c, 2f, 3a, 3b, 3c plus
  - a) Hydrostatic test of completed system

All of the above fabrication operations were performed under quality control programs approved by WPS and/or its agent with frequent audit of adequate implementation of the quality control program. These programs meet the intent of the 10CFR50, Appendix B, and those programs used for pipe fabrication and pipe erection have been audited by the Region III compliance office of the AEC.

Documentation of all of the above is contained in Quality Control Files on the plant site.

Special consideration was given to the containment penetration since, in addition to the above it was designed for 1-1/2 times the system design pressure and to meet ASME Section III, Class B design and fabrication requirements.

It should be noted that Safety Guide 26 and ANSI Standard N18.2 require Group B quality standards or Safety Class 2 standards up to and including the outermost containment isolation valve. The Kewaunee plant has provided this quality level to the turbine stop valve, i.e., our quality control requirements on the piping downstream of the safety valves far exceed those recommended by either the AEC or ANSI.

B. Feedwater

The feedwater lines are generally described in Section 10.2.2 of the Kewaunee FSAR. This section will provide further descriptive information concerning the physical location aspects of the feedwater lines and the controls exercised to assure that high quality standards were met. The feedwater lines will be discussed to describe physical location and a general discussion will follow on the quality control aspects.

The feedwater pumps are located in the basement of the Turbine Building, with the discharge piping combining prior to entry into the high pressure feedwater heaters located on the mezzanine floor of the Turbine Building. The feedwater piping again combines into a single header after passing through the high pressure feedwater heaters, rises upward and then westward through the control rod drive equipment room and then northward where it splits with one line going down below the mezzanine floor of the Auxiliary Building, then west toward containment, first through the feedwater control valve, then the feedwater line restraint block, the feedwater isolation valve and then into containment to Steam Generator 1B. The other line continues north from the split point, around the refueling water storage tank vault and into the Zone SV area of the Auxiliary Building. The line proceeds through the Auxiliary Building, passing over the volume control tank vault, over the radioactive piping penetration area and into the northwest quadrant of the Auxiliary Building,

entering the area at the same floor elevation as the Main Steam line penetration, then turning downward one floor below the Main Steam line, goes through the feedwater line restraint block, turns toward containment and the feedwater isolation valve and enters containment to Steam Generator 1A. This routing is shown on Figures 1.2-4, 1.2-6 and 1.2-10 of the Kewaunee FSAR.

The 16-inch outside diameter feedwater piping is ASTM A-106 Grade B, seamless pipe material, and the 22-inch (outside diameter) feedwater piping is ASTM A-155, Grade KC-70, Class 1 plate pipe, both of which have seen extensive utilization in piping systems and pressure vessels for use within the power industry.

In general, all materials, design, shop and field fabrication, erection and testing conforms to the requirements of the Code for Pressure Piping, USAS B31.1.0, 1967, and applicable requirements of the ASME Boiler and Pressure Vessel Code, ASTM and all state and local code requirements, latest editions in effect as of the date of the contract (August, 1969). All stress analyses were independently reviewed and verified.

The 16-inch OD and 22-inch OD feedwater piping has been analyzed for thermal, seismic (O.B.E. and D.B.E.) and dead weight loads, and the stresses were combined in accordance with B31.1.0;1967, and applicable code cases. All analyses were independently reviewed and verified.

It should be noted that ANSI Standard N18.2 requires feedwater pipe to be Safety Class 2 up to and including the outermost containment isolation valve, whereas our analysis has extended this design requirement to the anchor located near the feedwater pumps in the turbine building.

The quality control documentation obtained on the Feedwater System piping consists of the following:

1. Plate Material
  - a) certified chemical and physical test reports traceable to heat numbers
  - b) 100% ultrasonic inspection of plate material

2. Pipe Material
  - a) certified chemical and physical test reports traceable to heat numbers
3. Rolled and Welded Pipe and Fittings, Seamless Pipe and Fittings
  - a) Welding procedures and weld procedure qualifications
  - b) Welding operator qualifications
  - c) Welding rod certified test report
  - d) 100% radiography of longitudinal welds
  - e) 100% magnetic particle inspection of longitudinal welds
  - f) Identification of welds, by weld number, and traceability of weld operators, weld rod materials, film numbers and MT reports to actual weld.
  - g) Normalizing treatment temperature recording charts (plate pipe only)
  - h) Hydrostatic test of each length of pipe
  - i) Photomicrographs from one end of each two lengths (plate pipe only)
4. Fabricated Pipe - 3a, 3b, 3c, 3f above plus
  - a) 100% radiography of all butt welds
  - b) 100% magnetic particle inspection of all socket, fillet and nozzle welds
  - c) Pre-heat and stress relieving temperature recorder charts
5. Erected Pipe - 3a, 3b, 3c, 3f, 4a, 4b, 4c plus
  - a) Hydrostatic test of completed system

All of the above fabrication operations were performed under quality control programs approved by WPS and/or its agent with frequent audit of adequate implementation of the quality control program. These programs meet the intent of 10CFR50, Appendix B, and those programs used for pipe fabrication and pipe erection have been audited by the Region III compliance office of the AEC.

Documentation of all of the above is contained in Quality Control Files on the plant site.

Special consideration was given to the containment penetration since, in addition to the above, it was designed for 1-1/2 times the system design pressure and to meet ASME Section III, Class B design and fabrication requirements.

It should be noted that Safety Guide 26 and ANSI Standard N18.2 require Group B quality standards or Safety Class 2 standards up to and including the outermost containment isolation valve. The Kewaunee plant has provided this quality level to the anchor near the feedwater pumps, i.e., our quality control requirements on the piping upstream of the isolation valves far exceed those recommended by either the AEC or ANSI.

## SECTION II

### DESCRIPTION OF STRUCTURES

#### A. Potentially Affected Structures

The 8-inch diameter branch lines of the Main Steam system are located in three areas of the Auxiliary Building and they are as follows:

##### Area A (Figure 1.2-10 of the FSAR)

1. Main Steam Dump Valve Header to Atmosphere
2. Main Steam Relief Header to Atmosphere.

Located at floor elevation 618'-0" in the northwest quadrant on the steam generator 1A side outside of the Containment Building. (See Figure I - Compartment B.)

##### Area B (Figure 1.2-6 and 10 of the FSAR)

1. Main Steam Relief Header to Atmosphere.

Located at floor elevation 616'-0" on the east (exterior) side of Containment Building on the steam generator 1B side.

(See Figure II - Compartment D.)

##### Area C (Figure 1.2-7 of the FSAR)

1. Main Steam Dump Valve Header to Atmosphere.

Located at floor elevation 642'-3" on the east (exterior) side of Containment Building on the steam generator 1B side.

(See Figure II - Compartment B.)

The volumes and openings between compartments or the atmosphere are shown in Figures I and II.

Area B is within Zone SV which has a relatively low leakage boundary but this area is designed with an opening to relieve pressure built-up.

W.P.S. CORP.  
KEWAUNEE NUCLEAR POWER PLANT  
PROJECT NO. 23-7127A

EL. VARIES:  
606'-0" TO  
649'-6"

A = 1,125,000 FT<sup>3</sup>

B = 17,200 FT<sup>3</sup>

C = 7,300 FT<sup>3</sup>

D = 13,500 FT<sup>3</sup>

E = 6,750 FT<sup>3</sup>

F = 76,500 FT<sup>3</sup>

G = EXTERIOR

NOTE:

LINES BETWEEN  
COMPARTMENTS INDICATE  
COMMUNICATING SURFACE  
AREA OPENINGS.

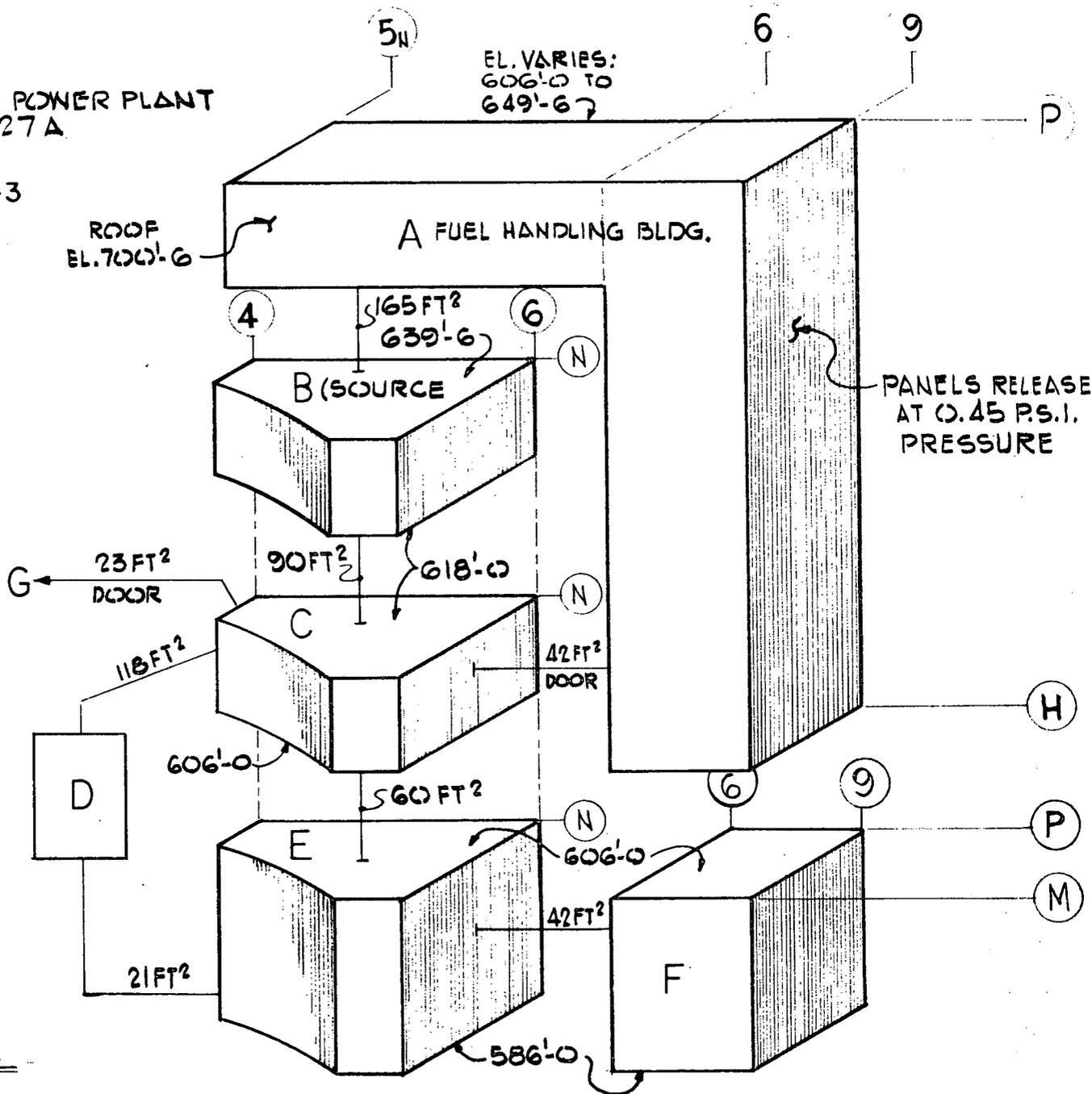
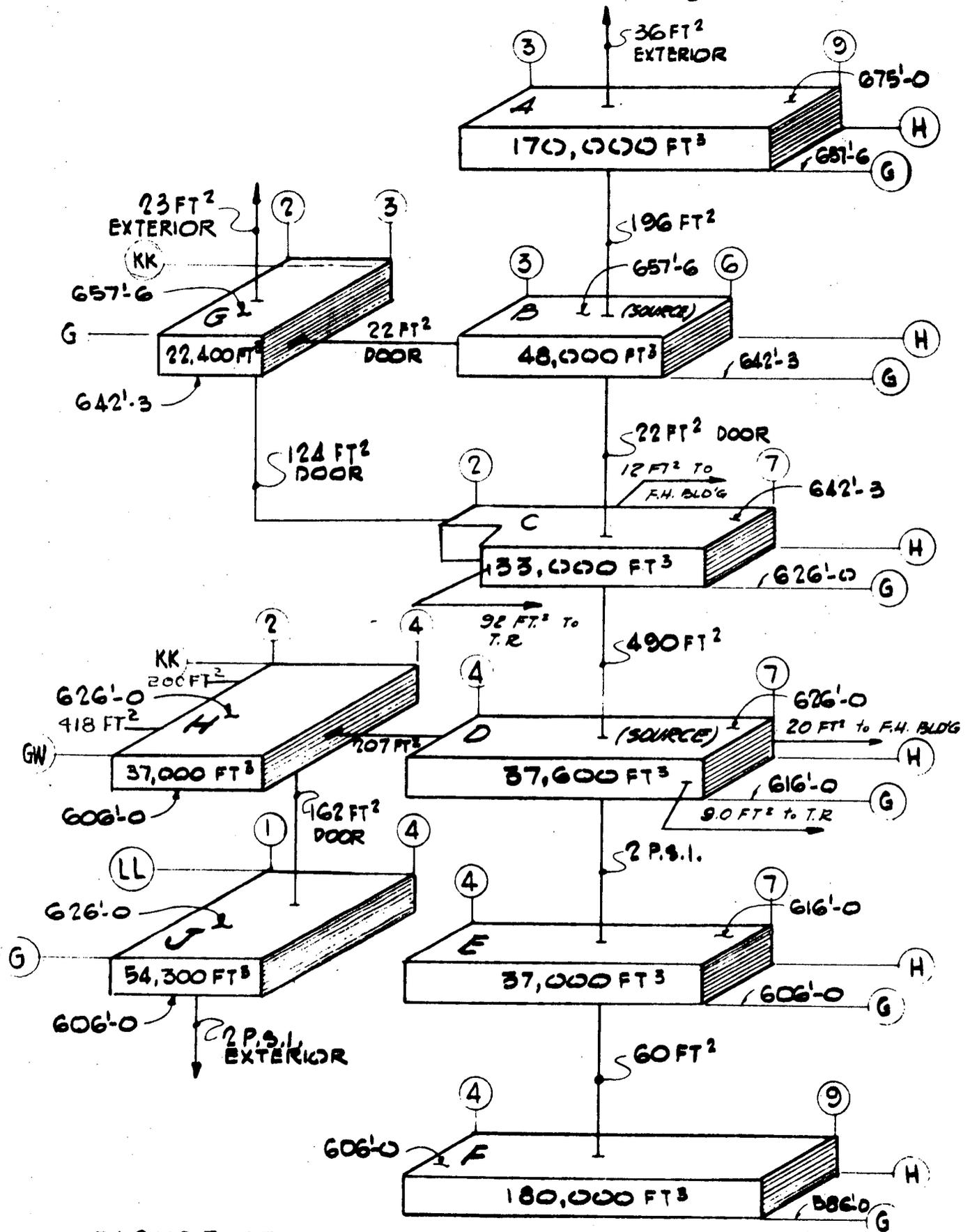


FIGURE I



**FIGURE II**

**NOTE** : LINES BETWEEN COMPARTMENTS INDICATE COMMUNICATING SURFACE AREA OPENINGS.

Areas A and C are not within Zone SV. Thus the boundaries are of standard construction and more leakage paths to other areas are available than were assumed for the analyses.

B. Structural Capability of Area Walls and Floors

Area A

This portion of the structure is Class I, specifically designed to house the Main Steam system as it exits the Containment Building. It is a reinforced concrete building 53'-6" high of which a portion from the mezzanine floor down to the basement is contiguous with the Containment Building and the upper 33'-6" is cantilevered.

The structure is designed to withstand the effects of seismic excitations (OBE and DBE) and tornadic forces including tornado wind induced missiles and a pressure differential of 3 psi.

The stress limits of the reinforcing steel and concrete are  $f_s = .90$  Y.S. and  $f_c = .75 f'_c$  respectively for tornado forces. (Table B.6-2 of the FSAR).

Areas B and C

These areas are also located within the Class I reinforced concrete Auxiliary Building. The exterior boundaries of the structure are designed to the same conditions as Area "A" and are capable of withstanding tornado induced pressure differentials of 3 psi. The internal walls and floors are designed to withstand the effects of Class 1 seismic, dead, live and equipment loads and tornado differentials (where applicable).

The structural strength of these boundaries is in excess of that required to accommodate the pressure build-up of an 8-inch rupture.

SECTION III  
DISCUSSION OF ANALYSES AND RESULTS (8 INCH)

A. Building Pressures

The local pressure effects on building walls and floors were calculated for the design case which is the rupture of an 8" branch connection for the safety, relief, and dump valves. The compartments in which these branch lines are located are identified in Section II on structures.

The evaluation principally considers two pressure effects. These are: 1) the amount of rapid pressurization in the compartment in which the rupture is assumed to occur and 2) the longer term pressurization of the entire affected volume into which the total contents of the steam generator is discharged. The peak initial pressure of the local compartments in which an 8" branch line break could occur and the peak pressures of the entire affected volume are shown on Table III A-1.

Considering that the structures can withstand, at the least, 3 psig, the design basis accident results in no structural damage.

The widely used CONTEMPT code was used to determine the pressures and temperatures. The blowdown was assumed to occur when the reactor coolant system was at hot standby with the steam generator pressure at 1000 psig. The blowdown rate was assumed to be 700 lb<sub>m</sub>/sec with an enthalpy of 1198 BTU/lb<sub>m</sub>. The rate was assumed to be constant until the stored energy of one steam generator was discharged. For individual compartments no heat transfer to the structures was considered. For compartment combinations (total affected volume) heat transfer to structures was considered. No heat removal by ventilation was assumed.

TABLE III A - 1

## COMPARTMENT &amp; ENTIRE AFFECTED VOLUME

## PEAK PRESSURES &amp; TEMPERATURES

LOCATION	PEAK PRESSURE DIFFERENTIAL, PSI	TIME AT PEAK PRESSURE DIFFERENTIAL	PEAK TEMPERATURE	TEMPERATURE DOWN TO 120°F
<u>Compartment</u>				
B (see Fig I)	0.6	2 msec		
D (see Fig II)	0.5	2 msec		
<u>Total Affected Volume</u>				
I Compartment A & B (See Fig.I)	0.6	~ 5 msec	~ 180°F	Less than 30 minutes
II Compartment A & B (See Fig.II)	1.74	~ 50 msec	~ 150°F	Less than 15 minutes

The computer code model assumes that a steam line break accident can be separated into phases, such that the results of the analysis of one phase serves as the conditions of the time-dependent input of the next phase. Thus, the model is only concerned with the pressure and temperature in the compartment. The computer program input provides for the description of the steam line blowdown characteristics. The model considers the compartment volume to be separated into a liquid region and vapor region. Each region is assumed to have a uniform temperature, but the temperatures of the two regions may be different. The total affected volume, when the heat sink option is used, is represented as a heat-conduction structure whose behavior can be described by the one-dimensional multi-region heat-conduction equation.

The calculation proceeds as follows. The initial atmosphere conditions are determined from ambient pressure (14.7 psia), temperature (80°F), and 30% relative humidity. All heat sinks are initially at 80°F. Time advancement is started by evaluating the steam mass and energy input rates at the midpoint of a time interval, multiplying by the time interval, and adding these increments to the current amounts in the zone vapor region. Heat losses or gains to the heat conducting sections, when considered, are estimated by using the heat transfer rates from the previous time step or the steady state conditions for the initial time step. Pressure and temperatures of the liquid and vapor regions are then calculated from the mass, volume, and energy balance equations. These new temperatures are used for the boundary conditions for the transient heat-condition solution. The resulting heat transfer rates for the end of the time step are averaged with the heat transfer rates at the beginning of the time step to correct the previous estimate of the energy in the containment volume. Mass, volume, and energy equations are then solved for the second time for the pressures and temperatures within the zone volume. These conditions are then used as the initial conditions for the next time step.

The code considers leakage past the compartment or through the outside boundary of the total affected volume by assuming the leakage goes to ambient pressures of 14.7 psia. Where a door or duct opens at an elevated pressure, this characteristic is included in the calculations. The parameters used for the analysis are shown on Table III A-2.

An evaluation of possible building pressure effects resulting from feed-water line rupture shows that the mass-energy relationship of the feed-water is less than 1/20 that of the main steam. Thus, the resultant pressure build-up in the Auxiliary Building compartments is negligible.

TABLE III A - 2

## COMPARTMENT &amp; TOTAL AFFECTED VOLUME PARAMETERS

<u>LOCATION</u>	<u>VOLUME</u>	<u>EXIT AREA</u>
<u>Compartment</u>		
B. (see Figure I)	17,200	$165 + 90 = 255 \text{ ft}^2$ at 14.7 psia
C. (see Figure II)	37,600	$490 + 207 + 20 + 9 = 726 \text{ ft}^2$ at 14.7 psia
<u>Total Affected Volume</u>		
I. Compartments A & B (see Fig. I)	1,142,200	above 0.5 psi: $1000 \text{ ft}^2$ at 14.7 psi
II. Compartments A and B (see Figure II)	218,000	above 0.25 psi: $36 \text{ ft}^2$ at 14.7 psia
<u>Common Parameters</u>		
Initial Air Temperature		80°F
Relative Humidity		30%
Initial Heat Sink Temperature		80°F
Steam Conditions		
Blowdown Rate		700 lbm/sec
Enthalpy		1198 Btu/sec

B. Building Temperatures

The post-incident peak temperatures are shown in Table III A-1. They are well below the temperatures for which the principal electrical and control equipment has been designed, as discussed in Section III F.

### C. Pipe Whip Effects

Method of Calculating Forces: The evaluation of the effects of pipe whip is based upon a review of the physical arrangement of the piping system under consideration in conjunction with the evaluation of the ultimate load carrying capability of the piping. At any point in the pipe where the load resulting from a rupture exceeds the ultimate load carrying capability, it is assumed that a plastic hinge is formed and that the pipe will rotate freely about this point unless restrained at another point.

The load carrying capability of a pipe is defined in terms of the ultimate bending strength, which for carbon steel piping is,

$$M_{ult} = (1.33) (r_1^3 - r_2^3) \sigma$$

where:  $r_1$  = Outside radius

$r_2$  = Inside radius

$$\sigma = (0.75) \sigma_{ult}$$

$\sigma_{ult}$  = Minimum ultimate tensile strength of pipe at maximum normal operating temperature.

If either of the two following conditions are found to exist, it is assumed that pipe whip would result:

- a. A circumferential break such that a section of pipe is subjected to a cantilever type loading in a manner which produces a bending moment greater than  $M_{ult}$ .

- b. A longitudinal break resulting in bending moments greater than  $M_{ult}$  at the point of break and at the restraint points on either side of the break.

A whipping section of pipe is assumed to move freely until striking an object capable of stopping it and no recurring plastic hinges are assumed to develop. Further, it is assumed that the pipe will neither rebound nor change directions.

It is assumed that a whipping pipe will not damage another pipe of equal or greater size and schedule.

Restraint/Anchor Loading: Determination of the maximum loads on pipe rupture restraints and anchors is based upon the following assumptions:

- a. Pipe rupture loads are "point" loads.
- b. Restraints or anchors act as "fixed" supports.
- c. Loads can originate from either a pipe rupture force in the piping system under consideration or a jet impingement force resulting from a break in adjacent Class I, II or III piping.

Pipe whip analysis on the Main Steam System has been performed for an 8" branch line failure. The review has specifically defined the areas of the Main Steam line where a pipe rupture could result in pipe whip and identifies the Class I structures and equipment which may be subsequently damaged. The Main Steam pipe whip design review document identifies the break location, the section of pipe that would whip, and the specific target jeopardized. Restraints have been located such that the pipe was not allowed to whip if it would impair containment integrity, structural integrity of the Auxiliary Building or Control Room, or a required safety system function.

In those cases where the Main Steam line would be allowed to whip, neither containment integrity nor a safety system function will be impaired

Analysis of electrical equipment exposed to pipe whip effects considered possible between the provided restraints has disclosed the electrical equipment associated with the protective features required can not be damaged.

D. Jet Force or Impingement Effects

Method of Analysis: Pipe ruptures were postulated in the portions of piping systems pressurized during normal plant operations. The resulting forces were determined in accordance with the criteria specified below, and potential damage to the system under consideration and to other Class I systems and equipment was evaluated.

- a. Ruptures were postulated in Class I, II and III high pressure piping adjacent to Class I systems or equipment.
- b. Potential damage to required Systems and Equipment, including the containment vessel, resulting from pipe rupture was evaluated to assure that their minimum required performance is not reduced below that specified in the FSAR.

The evaluation of damage propagation from these forces was based upon piping configuration, location of barriers and supports, locations of postulated breaks, separation of redundant parts of the system, and location of other systems and equipment in relation to the system under consideration.

Rupture Forces:

The initial force at the point of rupture is

$$F = 1.2PA$$

where:

P = static pressure at point of rupture

A = flow area of the pipe

Break Size:

The area of any postulated rupture is assumed equal to the flow area of the ruptured pipe. A longitudinal break is assumed to be rectangular in shape with length equal to two times the inside diameter of the ruptured pipe.

### Jet Impingement Load:

The jet impingement load is defined as the load on a component (piping or equipment) of the undeflected jet from an instantaneous circumferential or longitudinal break of an adjacent pipe. This load is the result of both static and dynamic jet effects.

At the point of rupture, the jet pressure is assumed equal to the rupture pressure (P), and the effective loading assumed to be the break area (A). As the flow progresses away from the point of rupture the jet is assumed to diverge at an included angle of 45°. Hence, the effective loading area at some distance from the point of a longitudinal break is,

$$A_i = [L_1 + 2L_3 \tan 22-1/2^\circ] [L_2 + 2L_3 \tan 22-1/2^\circ]$$

where:

$L_1$  = width of break

$L_2$  = length of break

$L_3$  = distance to target object

and the static jet pressure at some distant target object with the effective load area is,

$$P_i = P \frac{A_i}{A}$$

The effective load on a distant target is the sum of the static and dynamic forces

$$F_e = f P_i A_e + F_d$$

where:

$A_e$  = projected area of the target object

$f$  = shape factor of the target object

$F_d$  = average dynamic load at distance of target object from break location.

For the design case, only the jet impingement forces adjacent to 8" branch line connections to headers were considered. The effect on adjacent structures and equipment results in no adverse consequences.

The feedwater piping system has been analyzed with regard to the consequences of potential rupture jet action in accordance with criteria set forth in FSAR Appendix B.5. No serious structural damage will occur due to the jet impingement and no engineered safety features required for this accident are impaired.

E. Environmental Effects of Infiltration of Steam

1. Control Room and Relay Room

The control room, control room ventilation equipment and relay room do not communicate with those areas of the auxiliary building which are subject to pressure buildup, jet effects or pipe whip, and are thus not affected by the design basis incident (8" break in branch line). The outside air supply ducts to the control room pass through the upper floor area (657'-6") of the Zone SV area and are subject to collapse from the external pressures developed in that compartment as a result of the design basis 8" header break of the main steam system. Because of the very short duration of the compartment pressures and the capability to obtain access to this area of collapsed makeup air duct work in a short period of time for repair work before CO<sub>2</sub> build-up in the control room to unacceptable levels, there will be no apparent effect on control room environment. The ceiling of the control room ventilation equipment area forms a boundary for the steam atmosphere which could be present in the 657'-6" area of the auxiliary building, but because of the low pressures developed, the structural integrity of this barrier will be maintained.

2. Electrical Equipment

Motors

All engineered safety system motors have been purchased with an insulation class of Type "B" or better. Type "B" insulation consists of Mica, Asbestos, Fiber Glass, other inorganic materials and synthetic resins capable of operation at a total temperature of 130°C (266°F).

### Solenoid Valves

All solenoid valves have been purchased with an insulation class of Type "H". Type "H" insulation consists basically of silicones capable of operating at a total temperature of 180°C (356°F).

Note: Total Temperature includes expected temperature rise above ambient due to electrical current passing through the insulated wiring in question. Total temperature is important in that it is the maximum value that the insulation can be exposed to without degradation of the insulation. As a rule of thumb each 10°C of temperature rise above the specified total temperature will approximately halve the effective life of Class "B" insulation. Degradation of the overall life of the motor after the accident is not of prime concern. There is no immediate problem of the device failing to function during the accident and for a reasonable time after.

### Electrical Cable

All Power and Control cables used in the Auxiliary Building have been purchased from the same vendors and to the same specifications and quality control procedures as power and control cables used inside containment and have been prototype tested to the same environmental condition as predicted inside containment.

### Motor Starters

Motor Starters are drawout mounted in centralized motor control centers which are reasonably drip-proof but not sealed from gradual penetration of temperature and humidity. Individual components of a motor starter that might be affected by adverse environmental conditions have been analyzed as follows:

(a) Motor Starter Coils and Control Transformers

All operating coils and control transformers for motor starters are encapsulated in epoxy resin and will function properly in the predicted environment.

(b) Circuit Breakers

All circuit breakers included with motor starters will experience small reduction of their trip setting with ambient temperatures above 50°C (122°F). Since these trip settings are for short circuit protection not overload protection, an ambient increase to predicted accident value should not cause false tripping of circuit breakers due to operation of motors during accident.

(c) Exposed Electrical Parts or Conductors Within Starters

All exposed electrical parts within motor starters are insulated to industry standards for 600 volt Class equipment. No flash over or failures are predicted due to any moisture that may enter a motor load center during the accident.

(d) Thermal Overload Relays

Due to their method of operation thermal overload relays are temperature sensitive. An investigation is being initiated to determine the effect of predicted temperature and duration during an accident on the overload relays. In event the presently supplied relays appear to have possibility of false operation during an accident they will be, on a case-by-case basis, oversized, removed or bypassed.

All Electrical Equipment-Pressure Effects:

Analysis of electrical equipment in the auxiliary building disclosed that no electrical equipment will be damaged or impaired by the pressure effects postulated for the accident.

F. Description of Functions Required During and Following the Accident

This section of the report defines the equipment and structures required to mitigate the consequences of a main steam or feedwater system failure within the Auxiliary Building. This equipment must accomplish the following functions:

- a) Insure that sufficient electrical power (AC and DC) is available for all required equipment.
- b) Inject high concentration (20,000 ppm Boron) Boric Acid into the reactor vessel to off-set the reactivity effects of reactor coolant system cooldown.
- c) Provide a source of borated water (2000 ppm Boron) to refill the reactor coolant system due to "shrinkage" on cooldown.
- d) Provide a heat sink for the reactor coolant system.
- e) Insure that any required piece of equipment is adequately cooled.

1. Structural Components

The structural integrity of any compartment of the Auxiliary Building, whose failure would degrade any of the electrical mechanical or instrumentation equipment listed in the following paragraphs or would cause an intolerable failure in any other system, was required for the design basis failure. In particular, the main control room, relay room and control room ventilation equipment room were to remain inviolate to damage and hostile environment as a result of either the design basis main steam or feedwater system failure.

2. Mechanical Components

The following mechanical equipment is required to function in its intended manner following this referenced failure:

Safety Injection Pumps 1A and 1B  
Turbine Driven Auxiliary Feedwater Pump  
Auxiliary Feedwater Pumps 1A and 1B  
Service Water Pumps 1A, 1B, 1C and 1D  
Diesel Generators 1A and 1B

Valves

32109 SI Pump Suction From RWST  
32110 SI Pump Suction From RWST  
32104 SI Pump Suction From Boric Acid Tanks  
32105 SI Pump Suction From Boric Acid Tanks  
32106 SI Pump Suction From Boric Acid Tanks (Locked Out)  
32107 SI Pump 1A Suction  
32108 SI Pump 1B Suction  
32130 SI Pump Recirculation  
32131 SI Pump Recirculation  
32094 SI Pump Cold Leg Injection (Locked Out)  
32095 SI Pump Vessel Injection  
32093 Reactor Vessel Injection  
32098 Reactor Vessel Injection  
32092 Loop A Cold Leg Injection  
32097 Loop B Cold Leg Injection  
32027 TDAFWP Discharge to Steam Generator 1A  
32028 TDAFWP Discharge to Steam Generator 1B  
32029 AFWP 1A Suction From Service Water  
32030 AFWP 1B Suction From Service Water  
32031 TDAFWP Suction From Service Water  
32038 TDAFWP Steam Supply From Steam Generator 1A  
32039 TDAFWP Steam Supply From Steam Generator 1B  
SD30-1 TDAFWP Trip and Throttle Valve  
32040 TDAFWP Steam Admission Valve  
32015 Steam Generator 1A Feedwater Isolation  
32016 Steam Generator 1B Feedwater Isolation  
31015 Main Steam Isolation Valve 1A  
31016 Main Steam Isolation Valve 1B  
31170 Atmospheric Relief Valve 1A  
31174 Atmospheric Relief Valve 1B

TDAFWP = Turbine Driven Auxiliary Feedwater Pump

AFWP = Auxiliary Feedwater Pump

SI = Safety Injection

3. Electrical Components

In addition to the power supplies, controls and protection for the mechanical equipment previously listed, the following electrical devices and associated controls are required to function in their intended manner:

Reactor Trip Breakers

D-C Batteries 1A and 1B

4160V Buses 1-5 and 1-6

480V Buses 1-51, 1-52, 1-61 and 1-62

4. Instrumentation

The following instrumentation is required to function in its intended manner:

\* Steam Generator 1A Level LT-461, 462 and 463

\* Steam Generator 1B Level LT-471, 472 and 473

Steam Generator 1A Pressure PT-468, 469 and 482

Steam Generator 1B Pressure PT-478, 479 and 483

∅ Boric Acid Tank 1A Level LT-106, 172 and 190

∅ Boric Acid Tank 1B Level LT-102, 171 and 189

Steam Generator 1A Steam Flow FT-464 and 465

Steam Generator 1B Steam Flow FT-474 and 475

\* Steam Generator 1A Feedwater Flow FT-466 and 467

\* Steam Generator 1B Feedwater Flow FT-476 and 477

Reactor Coolant Temperature TE-401A, 401B, 402A, 402B,  
403B, 404A, and 404B

\* Required for Feedwater Line Break Only

∅ Required for Main Steam Line Break Only

G. Re-Entry to Auxiliary Building Following Steam Line Rupture

Steam Line Break Accident Dose Analysis

As indicated in Section 14.2.5 of the Kewaunee FSAR, both whole body and thyroid doses resulting from any rupture of main steam line are below 3% of 10CFR100 guidelines. Calculations were based on the incredible assumption that all activity associated with 1% defective fuel in the primary coolant system was suddenly expelled to a steam generator and then out the break. This resulted in a thyroid dose at the site boundary of 4.7 Rem and a whole body dose of 0.51 Rem.

Calculations for external gamma dose rate inside Auxiliary Building following steam line rupture indicate that the maximum dose rate will be less than 20 mrem/hr. Hence, external gamma dose rate presents no access restriction.

Scott face masks are provided to avoid any potential iodine airborne activity problem. These masks will allow access to the Auxiliary Building as soon as temperature has decreased to a tolerable level of approximately 120°F.

The temperature transient for the 8" diameter steam line break shown in Figure III A-1 shows that after the peak temperature has been reached the Zone SV temperature is down to 120°F in about 1/2 hour after the break occurred.

SECTION IV

MISCELLANEOUS PIPING SYSTEM ANALYSES

The consequences of failure of other piping systems within the Auxiliary Building from the effects of pipe whip, jet impingement, pressure buildup and flooding were evaluated.

The systems evaluated for these effects include:

- Safety Injection
- Residual Heat Removal
- Auxiliary Feedwater
- Chemical and Volume Control (CVC)
- Containment Spray
- \* Component Cooling
- \* Service Water
- Auxiliary Steam (AS)
- \* Demineralized Water
- \* Reactor Makeup Water
- Steam Generator Blowdown (SGB)
- \* Waste Disposal
- \* Spent Fuel Pool Cooling
  
- \* Evaluated for potential flooding effects only - these are not high energy piping systems.

Those high energy piping systems which are normally pressurized (CVC, AS, SGB) were evaluated to determine pipe whip, jet impingement and pressure buildup effect on that safeguard equipment which is required to mitigate the consequences of that line failure. If there was potential damage to required safeguards equipment, pipe restraints were added to preclude the damage from occurring.

It was found that none of the systems listed above had any detrimental effect on structures or equipment as a result of pressure buildup or flooding. For flooding effects, it was determined that either the system has too low a volume to endanger engineered safety features or the rate of rise of water level was low enough to allow operator action before affecting safeguards equipment.

**700,000 Shares**  
**Wisconsin Public Service Corporation**  
**Common Stock**  
**(\$8 Par Value)**

THESE SECURITIES HAVE NOT BEEN APPROVED OR DISAPPROVED BY THE SECURITIES AND EXCHANGE COMMISSION NOR HAS THE COMMISSION PASSED UPON THE ACCURACY OR ADEQUACY OF THIS PROSPECTUS. ANY REPRESENTATION TO THE CONTRARY IS A CRIMINAL OFFENSE.

	Price to Public	Underwriting Discounts(1)	Proceeds to Company(2)
Per Share .....	\$17.125	\$.625	\$16.50
Total .....	\$11,987,500	\$437,500	\$11,550,000

- (1) See "Underwriting" for information concerning indemnification of the Underwriters by the Company.
- (2) Before deduction of expenses payable by the Company estimated at \$63,000.

The Common Stock is offered subject to prior sale, when, as and if delivered to and accepted by the Underwriters, and subject to approval of certain legal matters by their counsel and by counsel for the Company. The Underwriters reserve the right to withdraw, cancel, or modify such offer and to reject orders in whole or in part.

**Merrill Lynch, Pierce, Fenner & Smith**  
Incorporated

**Robert W. Baird & Co.**  
Incorporated

IN CONNECTION WITH THIS OFFERING, THE UNDERWRITERS MAY OVER-ALLOT OR EFFECT TRANSACTIONS WHICH STABILIZE OR MAINTAIN THE MARKET PRICE OF THE COMMON STOCK OF THE COMPANY AT A LEVEL ABOVE THAT WHICH MIGHT OTHERWISE PREVAIL IN THE OPEN MARKET. SUCH TRANSACTIONS MAY BE EFFECTED ON THE NEW YORK STOCK EXCHANGE, ON THE MIDWEST STOCK EXCHANGE, OR IN THE OVER-THE-COUNTER MARKET. SUCH STABILIZING, IF COMMENCED, MAY BE DISCONTINUED AT ANY TIME.

#### AVAILABLE INFORMATION

*Wisconsin Public Service Corporation ("Company") is subject to the informational requirements of the Securities Exchange Act of 1934 and in accordance therewith files reports and other information with the Securities and Exchange Commission. Information concerning directors and officers, their remuneration and any material interest of such persons in transactions with the Company, as of particular dates, is disclosed in proxy statements distributed to shareholders of the Company and filed with the Commission. Such reports, proxy statements and other information can be inspected at the principal office of the Commission at 500 North Capitol Street, N. W., Washington, D. C. 20549, and copies of such material can be obtained from the Commission at prescribed rates. In addition, reports, proxy statements and other information concerning the Company can be inspected at the offices of the New York Stock Exchange and Midwest Stock Exchange, on which exchanges the Company's Common Stock is listed. Copies of annual reports to shareholders, including certified financial statements, are sent to holders of debt securities upon their request.*

#### THE COMPANY

The Company was incorporated under the laws of the State of Wisconsin in 1883. Its principal executive offices are at 700 North Adams Street, Green Bay, Wisconsin 54305. Its telephone number is 414-432-3311. It is engaged principally in the production, transmission, distribution, and sale of electricity and in the purchase, distribution, and sale of gas in northeastern Wisconsin and an adjacent part of upper Michigan.

#### USE OF PROCEEDS AND CONSTRUCTION PROGRAM

The Company will use the net proceeds from the sale of the Common Stock offered hereby to pay an equivalent amount of short-term borrowings incurred for interim financing of construction. The Company had \$3,500,000 of bank loans and \$2,400,000 of commercial paper outstanding at August 31, 1971 (See Note 12 of Notes to Financial Statements). About \$26,200,000 of bank loans and commercial paper will be outstanding at the date of sale of the additional Common Stock. Additional short-term borrowings will be required in the latter part of December 1971 for construction.

Construction expenditures for 1971 and 1972 are estimated to be \$52,000,000 and \$40,000,000, respectively, a total of \$92,000,000. These current estimates reflect substantial acceleration from prior estimates in the timing of project expenditures as well as increased project costs. See "Business-Regulation" for possible increased expenditures to provide additional environmental protection facilities.

Of this \$92,000,000, about \$29,000,000 will be used for the Company's share of the continuing construction of a 540,000 kilowatt nuclear generating plant (Kewaunee Plant) being built on the west shore of Lake Michigan near Kewaunee, for service in 1972, by the Company, Wisconsin Power and Light Company, and Madison Gas and Electric Company, of which the Company will own 41.2%. The Company's share of the cost of this plant, exclusive of nuclear fuel, will be about \$56,000,000, of which approximately \$27,000,000 was expended prior to 1971 and an additional \$15,500,000 was expended prior to August 31, 1971.

About \$12,000,000 will be the Company's share of expenditures during 1971 and 1972 on construction of a 527,000 kilowatt coal-fired plant (Columbia Plant) to be built on the Wisconsin River near Portage by the Company, Wisconsin Power and Light Company, and Madison Gas and Electric Company. It is estimated that the cost of the Company's 38.9% interest in the plant will be about \$51,000,000, of

which about \$1,500,000 was expended prior to August 31, 1971. It is scheduled for commercial service in 1975.

Other major expenditures in the two years include \$3,400,000 for a 43,500 kilowatt peaking plant, \$2,700,000 to complete installation of pollution abatement equipment at presently existing generating plants, and \$13,200,000 for transmission lines and their terminal substations. The remaining \$31,700,000 will be used for normal additions and improvements.

In addition to expenditures for construction, it is estimated that \$4,700,000 will be needed by the Company in 1971 and 1972, and \$9,000,000 in the years 1973 through 1975, as payments for fuel for the Kewaunee Nuclear Plant.

Construction expenditures for the years 1973 through 1975 are currently estimated to be approximately \$159,000,000.

The Company received proceeds of about \$24,800,000 from the sale of First Mortgage Bonds, 8¼% Series due 2001, sold in May 1971, about \$8,800,000 of which was applied to retire short-term indebtedness incurred for 1970 construction and the balance to 1971 construction.

The Company presently expects to sell new securities in 1972. The timing, amount, and type of securities to be sold will depend upon market conditions and other factors. See Note 1 to "Capitalization" for indenture limitations on issuance of First Mortgage Bonds.

### COMMON STOCK DIVIDENDS AND PRICE RANGE

The Company has paid regular quarterly cash dividends on its Common Stock in varying amounts since becoming publicly owned in December 1952. The Company's Common Stock is listed on the New York and Midwest Stock Exchanges. Cash dividends paid, and the reported price range of the Common Stock on the New York Stock Exchange, since January 1, 1966, were as follows:

	Dividends Per Share	Price Range	
		High	Low
1966 .....	\$ .90	21⅞	17
1967 .....	.98	20½	17⅝
1968 .....	1.06	22	17¾
1969 .....	1.10	22	15¼
1970 .....	1.13		
First Quarter .....	.27½	16⅞	15½
Second Quarter .....	.27½	17⅞	14½
Third Quarter .....	.29	15⅞	14⅜
Fourth Quarter .....	.29	17⅞	15⅞
1971 First Quarter .....	.29	19⅞	17⅞
Second Quarter .....	.29	18	16⅞
Third Quarter .....	.29	17⅞	16⅞
Fourth Quarter (through December 6) .....		17⅞	16½

Quarterly dividend rates of 27½¢ and 29¢ per share on the Common Stock became effective with the September 1968 and September 1970 payments, respectively. On October 14, 1971 the Board of Directors declared a dividend of 29¢ per share to the holders of the Company's Common Stock of record November 30, 1971 payable December 20, 1971. Purchasers of the Common Stock offered hereby will not be entitled to this dividend. Customarily, dividends are paid on the 20th days of March, June, September and December, to shareholders of record approximately three weeks earlier. The payment of dividends and the amount thereof is dependent upon earnings, the financial condition of the Company, and other conditions. See "Description of Common Stock—Limitation on Dividends and on Acquisition of Common Stock".

The reported last sale price of the Common Stock on the New York Stock Exchange on December 6, 1971, was 17 per share.

## STATEMENTS OF INCOME

The following statements of income of the Company for the five years ended December 31, 1970, have been examined by Arthur Andersen & Co., independent public accountants, as set forth in their report included elsewhere in this Prospectus. The statement of income for the twelve months ended August 31, 1971, not examined by independent public accountants, reflects, in the opinion of the Company, all adjustments (which include only normal recurring accruals) necessary to present fairly the earnings for such period.

	Year Ended December 31					Twelve Months Ended August 31, 1971
	1966	1967	1968	1969	1970	(Unaudited)
	(thousands of dollars)					
<b>OPERATING REVENUES (Note 13):</b>						
Electric .....	\$46,208	\$48,951	\$52,822	\$57,639	\$ 67,144	\$ 72,361
Gas .....	21,818	24,282	26,691	31,724	34,994	37,597
Bus .....	348	348	339	345	275	213
	<u>68,374</u>	<u>73,581</u>	<u>79,852</u>	<u>89,708</u>	<u>102,413</u>	<u>110,171</u>
<b>OPERATING EXPENSES:</b>						
Operation—						
Electric production fuels .....	8,948	9,998	10,891	12,694	16,108	17,918
Electric power purchased .....	927	960	1,505	2,127	1,682	1,498
Power capacity purchased or sold .....	1,125*	1,258*	559*	105*	77	388
Gas purchased for resale .....	11,764	12,817	14,862	18,438	20,488	21,601
Other .....	11,720	12,147	13,013	14,169	15,508	16,242
	<u>32,234</u>	<u>34,664</u>	<u>39,712</u>	<u>47,323</u>	<u>53,863</u>	<u>57,647</u>
Maintenance .....	4,392	4,927	5,133	5,590	6,506	7,096
Depreciation (Note 9) .....	7,313	7,726	8,414	9,402	10,281	10,914
Federal income taxes (Notes 9 and 10) .....	6,107	6,494	6,210	5,181	5,784	5,324
State income taxes .....	858	1,027	995	956	1,062	1,013
Property and other taxes .....	5,020	5,380	6,093	6,922	7,694	8,572
	<u>55,924</u>	<u>60,218</u>	<u>66,557</u>	<u>75,374</u>	<u>85,190</u>	<u>90,566</u>
<b>OPERATING INCOME</b> .....	<u>12,450</u>	<u>13,363</u>	<u>13,295</u>	<u>14,334</u>	<u>17,223</u>	<u>19,605</u>
<b>OTHER INCOME:</b>						
Dividends from Wisconsin River Power Co. ....	186	186	186	186	186	186
Other (net) .....	85*	87*	65*	53	182	213
	<u>101</u>	<u>99</u>	<u>121</u>	<u>239</u>	<u>368</u>	<u>399</u>
<b>GROSS INCOME</b> .....	<u>12,551</u>	<u>13,462</u>	<u>13,416</u>	<u>14,573</u>	<u>17,591</u>	<u>20,004</u>
<b>MISCELLANEOUS INCOME DEDUCTIONS</b> ..	54	40	50	56	37	37
<b>INCOME BEFORE INTEREST CHARGES</b> ....	<u>12,497</u>	<u>13,422</u>	<u>13,366</u>	<u>14,517</u>	<u>17,554</u>	<u>19,967</u>
<b>INTEREST CHARGES:</b>						
Interest on bonds .....	3,121	3,347	4,642	5,853	7,785	10,628
Amortization of debt discount, premium and expense (net) .....	146*	116*	178*	279*	438*	399*
Other interest .....	238	572	330	330	545	330
Interest charged to construction .....	95*	226*	796*	1,665*	1,698*	2,858*
	<u>3,118</u>	<u>3,577</u>	<u>3,919</u>	<u>4,239</u>	<u>6,194</u>	<u>7,701</u>
<b>NET INCOME</b> .....	<u>9,379</u>	<u>9,845</u>	<u>9,447</u>	<u>10,278</u>	<u>11,360</u>	<u>12,266</u>
<b>PREFERRED STOCK DIVIDEND</b>						
REQUIREMENTS .....	1,065	1,065	1,276	2,079	2,079	2,079
<b>EARNINGS ON COMMON STOCK</b> .....	<u>\$ 8,314</u>	<u>\$ 8,780</u>	<u>\$ 8,171</u>	<u>\$ 8,199</u>	<u>\$ 9,281</u>	<u>\$ 10,187</u>
<b>EARNINGS PER SHARE OF COMMON STOCK</b> †	<u>\$1.49</u>	<u>\$1.57</u>	<u>\$1.46</u>	<u>\$1.47</u>	<u>\$1.54</u>	<u>\$1.65</u>
<b>CASH DIVIDENDS DECLARED PER SHARE</b> ..	<u>\$ .90</u>	<u>\$ .98</u>	<u>\$1.06</u>	<u>\$1.10</u>	<u>\$1.13</u>	<u>\$1.16</u>

† Earnings per share of common stock were computed based on the weighted average number of shares outstanding which were 5,589,734 for the years 1966 through 1969, 6,014,734 for the year 1970 and 6,189,734 for the twelve months ended August 31, 1971.

\* Denotes red figure.

The Notes to Financial Statements are an integral part of these statements of income.

For the twelve months ended October 31, 1971, operating revenues, net income and earnings per share of Common Stock were \$110,914,000, \$12,115,000 and \$1.62, respectively. These amounts, not examined by independent public accountants, reflect, in the opinion of the Company, all adjustments (which include only normal recurring accruals) necessary to present fairly the earnings for such period.

The earnings for the twelve months ended August 31, 1971, and October 31, 1971, are not necessarily indicative of results to be expected for the year 1971, due to generally increasing costs expected during the remainder of 1971. Factors most significantly affecting earnings subsequent to August 31, 1971 and October 31, 1971 will be higher costs of gas purchased for resale, wages and interest. Another factor in the increased costs will be the effect of an estimated four month forced shutdown, beginning August 20, 1971, of the 65,900 kilowatt Weston Steam Plant generating unit No. 1. This will necessitate substantial power purchases and the use of less efficient generating units, resulting in costs in excess of those for normal Company generated power. An additional reason for reduced earnings will be the failure to receive regulatory approval of, or delays in the implementation of, rate increases (including purchased gas cost adjustments) during the initial price freeze covering the period from August 15, 1971, and under rate change review procedures after November 13, 1971, which may further extend the normal lag between the periods of increased costs and the time when these costs can be offset by increased revenues.

### RATE PROCEEDINGS

Within the past few years the Company entered into and completed the following rate proceedings:

Initial Filing (W-Wisconsin; M-Michigan*)	First Hearing	Amount Requested (E-Electric; G-Gas)	Amount Authorized (Annual Basis)	Effective With Billing Period
8-7-68 W	10-15-68	\$4,379,000 E 497,000 G	\$2,000,000 None	November 1969 None
8-7-68 M	12-16-69	250,000 E 81,000 G	250,000 81,000	July 1970 July 1970
10-24-69 W	2-13-70	6,295,000 E 2,680,000 G	2,631,000 471,000	May 1970 May 1970

\* The Company derives 2½% of its gross revenues in Michigan.

On November 3, 1970, the Company filed another application for increases in electric and gas rates in Wisconsin. Requests for \$5,000,000 and \$1,900,000 on an annual basis in electric and gas rates, respectively, were made at the first hearing on December 16, 1970. Additional hearings were held in June and September 1971 and a decision is pending.

On April 27, 1971, the Company filed proposed increases of approximately \$607,000 in wholesale electric rates, which were not affected by the above proceedings, with the Federal Power Commission, to become effective July 1971. This increase was suspended by the Federal Power Commission until December 1, 1971.

All rate increases and upward adjustments after November 13, 1971 are subject to review and limitation by the federal Price Commission under the Economic Stabilization Act of 1970 and, in the case of wholesale electric rates, are subject to specific approval by the Federal Power Commission. Other future effects of the President's Executive Orders under the Act, and the effect of future actions by the President and by Congress as they relate to the Company's requests for rate increases, or the Company's operations in general, cannot now be predicted.

## CAPITALIZATION

The following tabulation shows the capitalization of the Company as of August 31, 1971, and as adjusted to reflect the sale of the 700,000 shares of additional Common Stock:

<u>Title of Class</u>	<u>Authorized</u>	<u>Outstanding</u>			
		<u>As of August 31, 1971</u>		<u>As Adjusted</u>	
		<u>Amount</u>	<u>% of Capitalization</u>	<u>Amount</u>	<u>% of Capitalization</u>
		(Thousands of Dollars)		(Thousands of Dollars)	
<b>First Mortgage Bonds</b> .....	(1)	\$176,337	58.3%	\$176,337	56.2%
<b>Preferred Stock</b>					
Cumulative, \$100 par value, 362,000 shares outstanding .....	600,000 shs.	36,200	12.0%	36,200	11.5%
<b>Common Stock Equity</b>					
Common Stock, \$8 par value, 6,189,734 shares outstanding, 6,889,734 shares to be outstanding .....	7,000,000 shs.	49,518		55,118	
Premium on Capital Stock .....		4,981		10,931	(3)
Earnings Reinvested in the Business .....		35,266		35,266	
<b>Total Common Stock Equity</b> ..		<u>89,765</u>	<u>29.7%</u>	<u>101,315</u>	<u>32.3%</u>
<b>Total Capitalization</b> .....		<u>\$302,302</u>	<u>100.0%</u>	<u>\$313,852</u>	<u>100.0%</u>

- (1) The amount authorized under the First Mortgage and Deed of Trust dated January 1, 1941, and indentures supplemental thereto, is unlimited in expressed amount. Additional bonds can be issued up to 60% of the amount of bondable net property additions, provided that at the time of such issue the Company's earnings are sufficient to meet the indenture requirement that earnings applicable to bond interest (as defined) are at least twice the interest requirements on all bonds then outstanding and to be issued. The ratio of interest coverage prior to the most recent issue of \$25,000,000 of 8¼% bonds in May 1971 was 2.63, and immediately after such issue was 2.16. Under this limitation, the Company is unable to predict what amount, if any, of additional bonds would be issuable at the time of any required permanent financing in 1972. See "Rate Proceedings" and last paragraph under "Statements of Income" above.
- (2) See Statements of Capitalization, page 19.
- (3) Includes proceeds in excess of par value from sale of additional Common Stock.

Reference is made to Notes to Financial Statements—"Construction commitments" and "Wisconsin River Power Company" for information relating to construction (including the Company's proportional share of construction of joint power facilities) and long-term power purchase commitments.

On August 31, 1971, short-term borrowings amounted to \$5,900,000. It is expected that such borrowings will aggregate about \$26,200,000 at the date of sale. See "Use of Proceeds and Construction Program".



**Electric Business.** The Company owns the Pulliam Steam Plant at Green Bay and the Weston Steam Plant near Wausau, with capabilities of 406,500 and 152,800 kilowatts, respectively; a 31.8% share of the Edgewater Steam Plant Unit #4 at Sheboygan, owned jointly with Wisconsin Power and Light Company, with a capability of 322,600 kilowatts; two combustion turbines located at the Weston Steam Plant and at Marinette with capabilities of 21,000 kilowatts and 43,500 kilowatts, respectively; two diesel plants, with capabilities aggregating 6,900 kilowatts; and 15 hydro-electric plants with an aggregate effective capability during minimum recorded stream flow conditions of 51,000 kilowatts. The Company has a one-third share in the output of the 35,000 kilowatt Wisconsin River Power Company hydro-electric plants. The total capability available from all of these sources is about 796,000 kilowatts. Prior to 1968, the Company experienced its annual maximum loads in winter. During 1968 and 1969 the annual maximum loads, which occurred in August, were approximately equaled by the maximum loads during the following winters. In 1970, summer and winter maximum loads, on a one-hour integrated basis, of 651,000 kilowatts and 666,000 kilowatts occurred on August 10 and December 21, respectively. Because of this balance in seasonal loads, the Company experienced record high annual load factors ranging from 66.7% to 67.5% for these years. A peak of 667,000 kilowatts was reached on February 1, 1971 and a new peak of 714,000 kilowatts was reached on June 28, 1971.

The Company also owns 55 transmission substations with a transformer capacity of 2,462,390 kilovolt amperes; 100 distribution substations with a transformer capacity of 760,769 kilovolt amperes; and 16,404 route miles of electric transmission and distribution lines.

The Company has a power pool agreement with Wisconsin Power and Light Company and Madison Gas and Electric Company, under which the three companies commenced sharing reserve generating capacity January 1, 1970. This power pool agreement phased out a similar agreement between the Company and Wisconsin Power and Light Company under which the two companies had been sharing reserve generating capacity since December 1, 1963. Existing and planned interconnections with other neighboring utilities provide further means of sharing reserve capacities and interchanging energy.

**Gas Business.** The Company purchases its entire supply of natural gas from Michigan Wisconsin Pipe Line Company. Its present level of gas service is provided for by service contracts effective for 20 years beginning September 1, 1971. Due to shortages of gas supplies, Michigan Wisconsin Pipe Line Company has not offered any additional gas supply to its customers, and the Company has available to it, during the 12-month period ending August 31, 1972, the same annual volume that was available in the 12-month period ending August 31, 1971. Michigan Wisconsin Pipe Line Company has advised the Company that it will file an expansion project with the Federal Power Commission. It is expected that the Company's share of that expansion will be 2,600,000 Mcf of annual supply commencing September 1, 1972. This is adequate to satisfy normal annual retail expansion in the period September 1, 1972 to August 31, 1973. Some Alaskan gas may become available after 1976.

The Company, as a result of its own requests to the commissions, is presently operating under a Public Service Commission of Wisconsin order dated June 29, 1971, and a Michigan Public Service Commission order dated May 26, 1971, both of which restrict attachment of new customers, and restrict increase of service to existing customers, where the requirements of such attachments or increases exceed a certain volume. These orders apply only to large volume users. When additional supplies of gas are assured, the Company will ask the state regulatory agencies to modify or rescind the limitations.

It is possible that national shortages of gas supplies could cause some curtailment of the Company's present and future gas supply and service if the Federal Power Commission places limitations or determines allocations in the public interest.

Gas supply rates are governed by tariffs which are subject to adjustment by the supplier with the approval of the Federal Power Commission. The Company purchased 49,329,147 Mcf of gas for resale during the twelve months ended August 31, 1971. Gas properties include 2,358 miles of main.

**Regulation.** The Company is subject to regulation of its utility rates, service and securities issues by the Public Service Commissions of Wisconsin and Michigan, and is subject to regulation of its wholesale electric rates and certain other matters by the Federal Power Commission. It is also subject to limited regulation by local authorities. In the construction and operation of the Kewaunee Nuclear Plant it is subject to the jurisdiction of the Atomic Energy Commission. Rate increases after November 13, 1971 are also subject to review and limitation by the federal Price Commission under the Economic Stabilization Act of 1970.

The Company is subject to regulation with regard to air and water quality, and may be subject to regulation with regard to other environmental considerations, by various federal, state and local authorities. The Company cannot forecast the effect of all such regulation upon its generating, transmission and other facilities, or its operations, but has taken steps to meet the requirements of approved environmental regulations.

The application of federal and state restrictions to protect the environment involves or may involve review, certification or issuance of permits by various state or federal authorities, including the Administrator of the Environmental Protection Agency and the Corps of Engineers. Such restrictions, particularly in regard to emissions into the air and water, thermal mixing zones and water temperature variations, may limit, prevent, or substantially increase the cost of operation of the Company's generating installations and may require substantial investments in new equipment at existing installations. They may also require substantial investments above the figures stated under "Use of Proceeds and Construction Program", above, for proposed new projects and may delay or prevent authorization and completion of the projects.

The Company has initiated a program by which the two oldest boilers at its Pulliam Plant are being converted from coal-fired to gas or oil-fired units, and high-efficiency electrostatic precipitators are being added to the two boilers of the Weston Plant. This work is underway and is planned for completion by the fall of 1972 at a total cost of \$3,000,000.

While the six large boilers at the Pulliam Plant are already equipped with electrostatic precipitators, some upgrading will be necessary. This is under study with the intent that required modifications, under present criteria for emission of particulates, will be completed by 1975. The cost of these improvements may amount to \$3,000,000.

The Federal Environmental Protection Agency recently adopted ambient air standards relative to other pollutants, including sulfur and nitrogen oxides, which result from the operation of generating facilities. The State of Wisconsin is required to adopt a plan for implementation of such ambient air standards by January 1972, including standards restricting the emissions of sulfur and nitrogen oxides from existing facilities. The Company is unable at this time to forecast the cost of modifying its facilities so as to permit their operation in compliance with such standards.

In the water quality area, the Company has filed applications with the Corps of Engineers for permission to discharge waters from the Pulliam and Weston Plants, and water used during startup and testing of the Kewaunee Nuclear Plant. These applications became mandatory under renewed implementation of the Rivers and Harbors Act of 1899 which is applicable to industrial discharges into navigable waterways and their tributaries.

There have been recent federal efforts to place additional thermal release limitations on industrial waters discharged into the Lake Michigan Basin. At hearings thereon before the Wisconsin Department of Natural Resources the Company has resisted the application of these limitations to existing plants and to the Kewaunee Plant now under construction, and an early decision is expected. If adopted as proposed, these regulations would require the addition of closed cycle cooling facilities at the Kewaunee Plant by December 31, 1973 or 1974, depending on the type of system used. Some closed cycle cooling facilities or alternative improved methods of waste heat disposal for the Company's Pulliam Plant at Green Bay and for the Edgewater Unit #4 at Sheboygan, might also be required, depending on future studies of compliance with permitted discharge temperature limits. As applied to the Kewaunee Plant, a very general estimate would be that adoption of these proposals would cause at least a 7% increase in completed costs of that plant (representing an increase of about \$4,000,000 for the Company's 41.2% share of estimated completed cost of construction), would reduce the available power output of the plant by approximately 7%, of which the Company's share would be about 16,000 kilowatts, and would also have other adverse effects on operating efficiency. No provision for closed cycle cooling facilities has been included in the construction programs set forth under "Use of Proceeds and Construction Program" herein.

As the result of a recent federal court decision, the Atomic Energy Commission has adopted new environmental protection procedures which implement the National Environmental Policy Act of 1970 as it pertains to the licensing of nuclear power plants. The impact that these regulations will have on the Kewaunee Plant is not presently known. It is anticipated that this plant will be tested and placed in commercial service in late 1972. Prior to the testing and before the plant can be placed in service it is necessary for the Company to receive certain operating permits and licenses from the Atomic Energy Commission.

Construction of the new Columbia coal-fired plant being built near Portage, Wisconsin, in which the Company has a 38.9% interest, was approved by the Public Service Commission of Wisconsin in May 1970 after public hearing thereon. On September 29, 1971, the Commission, after further investigation and hearing initiated by a petition filed June 15, 1971 by the Attorney General of the State, who sought to halt construction, found that current construction activities of the owners are in compliance with the prior approval order and it dismissed the further investigation.

In a similar state court proceeding commenced in July 1971 by an environmental group and an individual alleging failure to obtain various state permits required for completion of construction or operation, the Circuit Court for Dane County in a decision dated July 22, 1971 denied a temporary injunction against continued construction, and no further hearing in that case has been scheduled. A similar action in the Federal District Court for the Western District of Wisconsin, begun in June of 1971 by the same parties and others, and based on allegations that the owners lack various federal permits, is pending and no hearing thereon has been scheduled.

The Wisconsin Department of Natural Resources, following extended hearings on various applications for permits relating to portions of the Columbia Plant, on October 1, 1971 entered its findings and conclusions essentially approving installation of a 480-acre cooling water lake and an ash disposal area, but requiring some modifications, further studies and applications on certain details of construction or operation not approved. The Department asserts continuous jurisdiction over all future construction or operation undertaken pursuant to permits granted by the Department. Numerous environmental groups and individuals, including some who are parties to the above-mentioned court proceedings, appeared in opposition to the proposed plant before the Wisconsin Department of Natural Resources, and some of them have petitioned the Circuit Court for Dane County for review of the Department's findings and conclusions. The Attorney General has announced that he will appear as public intervenor in opposition to the Department's findings and conclusions.

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## OPERATING STATISTICS

	Year Ended December 31					Twelve Months Ended August 31,
	1966	1967	1968	1969	1970	1971
(thousands of dollars)						
<b>OPERATING REVENUES:</b>						
<b>ELECTRIC:</b>						
Residential .....	\$16,860	\$18,202	\$19,761	\$21,361	\$ 24,628	\$ 26,148
Small commercial and industrial .....	5,866	5,991	6,384	6,937	10,738*	12,459
Large commercial and industrial .....	18,470	19,553	21,265	23,532	25,510*	27,399
Sales for resale .....	2,810	2,903	2,998	3,185	2,870	2,784
Other services and miscellaneous .....	2,202	2,302	2,414	2,624	3,398	3,571
Total Electric Revenues .....	<u>46,208</u>	<u>48,951</u>	<u>52,822</u>	<u>57,639</u>	<u>67,144</u>	<u>72,361</u>
<b>GAS:</b>						
Residential with space heating .....	10,666	11,912	12,644	14,353	15,641	16,799
Residential without space heating .....	1,486	1,426	1,266	1,153	1,058	1,040
Small commercial and industrial .....	2,071	2,309	2,453	2,731	2,973	3,065
Large commercial and industrial .....	7,558	8,588	10,282	13,441	15,215	16,577
Other service and miscellaneous .....	37	47	46	46	107	116
Total Gas Revenues .....	<u>21,818</u>	<u>24,282</u>	<u>26,691</u>	<u>31,724</u>	<u>34,994</u>	<u>37,597</u>
<b>BUS</b> .....	348	348	339	345	275	213
Total Operating Revenues .....	<u>\$68,374</u>	<u>\$73,581</u>	<u>\$79,852</u>	<u>\$89,708</u>	<u>\$102,413</u>	<u>\$110,171</u>

	(thousands of kilowatt-hours)					
<b>ELECTRIC GENERATION AND PURCHASES:</b>						
Steam generation .....	2,682,973	2,908,929	3,081,315	3,285,788	3,571,944	3,584,181
Hydro generation .....	302,863	326,763	351,543	329,572	266,269	305,043
Wisconsin River Power Co. purchases .....	70,749	65,035	75,237	73,536	62,667	71,951
Other purchases and generation .....	44,607	28,167	135,405	230,942	141,525	157,164
Total generation and purchases .....	<u>3,101,192</u>	<u>3,328,894</u>	<u>3,643,500</u>	<u>3,919,838</u>	<u>4,042,405</u>	<u>4,118,339</u>
Deduct: Losses and company use .....	270,041	272,900	290,075	302,576	313,098	303,173
Total Electric Sales .....	<u>2,831,151</u>	<u>3,055,994</u>	<u>3,353,425</u>	<u>3,617,262</u>	<u>3,729,307</u>	<u>3,815,166</u>

<b>SYSTEM PEAK LOAD—Kilowatts</b> (60 minute integrated readings) .....	515,000	539,000	582,000	621,000	666,000	714,000
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	(thousands of kilowatt-hours)					
<b>ELECTRIC SALES:</b>						
Residential .....	749,889	820,597	900,590	972,891	1,060,169	1,112,363
Small commercial and industrial .....	242,472	252,904	271,665	293,231	428,789*	488,308
Large commercial and industrial .....	1,454,463	1,563,828	1,699,709	1,839,833	1,845,090*	1,851,878
Sales for resale .....	302,330	334,420	395,141	424,404	290,672	249,117
Other services .....	81,997	84,245	86,320	86,903	104,587	113,500
Total Electric Sales .....	<u>2,831,151</u>	<u>3,055,994</u>	<u>3,353,425</u>	<u>3,617,262</u>	<u>3,729,307</u>	<u>3,815,166</u>

<b>ELECTRIC CUSTOMERS (at end of period):</b>						
Residential .....	148,292	152,562	157,498	161,510	165,165	168,272
Small commercial and industrial .....	20,911	21,134	21,136	21,344	22,596*	22,648
Large commercial and industrial .....	1,783	1,752	1,854	1,899	692*	761
Sales for resale .....	24	24	26	27	29	29
Other services .....	20,518	21,751	23,117	24,313	25,144	25,775
Total Electric Customers .....	<u>191,528</u>	<u>197,223</u>	<u>203,631</u>	<u>209,093</u>	<u>213,626</u>	<u>217,485</u>

\* Approximately 1,200 customers were reclassified from Large Commercial and Industrial to Small Commercial and Industrial in May and June 1970.

## OPERATING STATISTICS

	Year Ended December 31					Twelve Months Ended August 31, 1971
	1966	1967	1968	1969	1970	
<b>ELECTRIC UNIT STATISTICS:</b>						
Average use per residential customer (kwh) ..	5,129	5,471	5,822	6,105	6,510	6,706
Average revenue per residential customer .....	\$115.32	\$121.36	\$127.76	\$134.05	\$151.23	\$157.63
Average revenue per kilowatt-hour						
Residential .....	2.25¢	2.22¢	2.19¢	2.20¢	2.32¢	2.35¢
Small commercial and industrial .....	2.42	2.37	2.35	2.37	2.50	2.55
Large commercial and industrial .....	1.27	1.25	1.25	1.28	1.38	1.48
Total sales to ultimate consumers .....	1.70	1.68	1.67	1.69	1.86	1.94
<b>GAS PURCHASED AND PRODUCED:</b>						
	(thousands of therms)					
Natural gas purchased .....	283,525	318,351	368,081	440,894	485,126	510,753
Gas produced .....	248	305	164	39	297	380
Total purchased and produced .....	283,773	318,656	368,245	440,933	485,423	511,133
Deduct: Losses and company use .....	8,837	6,711	7,044	2,949	3,291	308
Total Gas Sales .....	<u>274,936</u>	<u>311,945</u>	<u>361,201</u>	<u>437,984</u>	<u>482,132</u>	<u>510,825</u>
<b>GAS SALES:</b>						
	(thousands of therms)					
Residential with space heating .....	104,737	118,710	126,301	143,799	154,514	164,910
Residential without space heating .....	11,046	10,798	9,443	8,589	7,510	7,242
Small commercial and industrial .....	22,289	24,996	26,789	29,736	32,084	32,612
Large commercial and industrial .....	136,238	156,678	197,886	254,997	286,957	304,803
Other service .....	626	763	782	863	1,067	1,258
Total Gas Sales .....	<u>274,936</u>	<u>311,945</u>	<u>361,201</u>	<u>437,984</u>	<u>482,132</u>	<u>510,825</u>
<b>GAS CUSTOMERS (at end of period):</b>						
Residential with space heating .....	61,935	68,009	74,763	82,213	88,317	90,431
Residential without space heating .....	28,811	27,073	25,561	23,208	21,104	19,851
Small commercial and industrial .....	6,735	7,090	7,401	8,026	8,342	8,325
Large commercial and industrial .....	1,182	1,324	1,503	1,656	1,916	2,077
Other service .....	1	1	1	1	1	1
Total Gas Customers .....	<u>98,664</u>	<u>103,497</u>	<u>109,229</u>	<u>115,104</u>	<u>119,680</u>	<u>120,685</u>
Total Space Heating Customers, Including Residential .....	67,747	74,450	81,758	89,981	96,716	99,136
<b>GAS UNIT STATISTICS:</b>						
Average use per residential customer (therms)						
With space heating .....	1,777	1,835	1,772	1,826	1,812	1,854
Without space heating .....	383	392	369	363	350	353
Average revenue per residential customer						
With space heating .....	\$180.93	\$184.16	\$177.38	\$182.30	\$183.44	\$188.84
Without space heating .....	51.50	51.78	49.41	48.71	49.30	50.71
Average revenue per therm						
Residential with space heating .....	10.18¢	10.03¢	10.01¢	9.98¢	10.12¢	10.19¢
Residential without space heating .....	13.46	13.20	13.41	13.42	14.09	14.36
Small commercial and industrial .....	9.29	9.24	9.16	9.18	9.27	9.40
Large commercial and industrial .....	5.55	5.48	5.20	5.27	5.30	5.44

## MANAGEMENT

The Company's Directors and Officers are:

### Directors

LEO T. CROWLEY,  
Chairman of the Board of Directors  
of the Company

L. G. ROEMER,  
Vice Chairman of the Board of Directors  
and retired President of the Company

D. W. FABER,  
Retired Vice President of the  
Company

W. E. FAY,  
Chairman, Champion Machinery Co.,  
Joliet, Illinois (manufacturers)

WILLIAM J. FROELICH,  
Attorney at law, Chicago, Illinois

JOHN M. ROSE,  
President, Kellogg-Citizens National Bank,  
Green Bay, Wisconsin

HAROLD P. TAYLOR,  
Vice Chairman of the Board of Directors of  
First Federal Savings and Loan Association of  
Wisconsin, Milwaukee, Wisconsin; retired  
President of the Company

JOHN P. WAGNER,  
President, Boynton Co., Milwaukee, Wisconsin  
(diversified real estate and other  
investments)

P. D. ZIEMER,  
President and Chief Executive Officer  
of the Company

### Officers

P. D. ZIEMER, President and  
Chief Executive Officer

PIERCE G. ELLIS, Senior Vice President—  
Division Operations

E. W. JAMES, Senior Vice President—  
Power Generation and Engineering

P. C. DAHLBERG, Vice President—  
Personnel

C. E. LAGEMAN, Vice President—Sales

J. H. LIETHEN, Secretary and Treasurer

D. A. BOLLUM, Controller

H. M. THOMPSON, Assistant Vice President—  
Budget Director

R. H. Knuth, Assistant Secretary and  
Assistant Treasurer

## DESCRIPTION OF COMMON STOCK

The following statements constitute a brief outline of information relating to the Common Stock, based upon provisions in the Company's amended Articles of Incorporation and resolutions of the Board of Directors of the Company establishing various outstanding series of Preferred Stock.

### General

The amended Articles of Incorporation authorize the Company to issue 7,000,000 shares of Common Stock (par value \$8 per share) and 600,000 shares of Preferred Stock (par value \$100 per share) issuable in series. The outstanding Preferred Stock consists of 362,000 shares of four series as shown in the

Statements of Capitalization herein. All shares of Preferred Stock of all series constitute one class and are of equal rank except as to dividend rates and redemption terms.

All unissued shares of Preferred Stock and any outstanding shares of Preferred Stock which may be redeemed or re-acquired, may, within the limitations stated in the amended Articles of Incorporation, be issued in series bearing the dividend rate and redemption terms fixed by the Board of Directors prior to the issuance of each series, and such issue requires no further approval by the holders of Common Stock.

### **Dividend Rights**

Subject to the preferential rights of the Preferred Stock and the restrictions referred to in the next paragraph, the holders of Common Stock are entitled to such dividends as may be declared by the Board of Directors out of surplus or net profits. Preferred Stock is entitled to cumulative dividends at such rate for each series as the Board of Directors may determine prior to the issuance of each series. The outstanding series of Preferred Stock are entitled to cumulative dividends at the respective rates per annum indicated by the title of each series as shown in the Statements of Capitalization herein.

### **Limitation on Dividends and on Acquisition of Common Stock**

Unless the capital represented by the Common Stock and the surplus accounts of the Company (not including premiums on Preferred Stock) is 25% or more of the total of its capital stock and surplus accounts and debt maturing one year or more after date of issue, dividends (other than dividends payable in Common Stock) or distributions on, or acquisitions for value of, Common Stock may not exceed 75% of net income applicable to the Common Stock for a preceding twelve month period; and if less than 20% may not exceed 50% of such net income. For purposes of such computations, capital, surplus and net income are defined in the amended Articles of Incorporation. As so defined, the Common Stock and surplus accounts at August 31, 1971, represented about 30% (about 32% on a pro-forma basis after giving effect to the issuance of the shares offered hereby) of the total of capital stock and surplus accounts and debt maturing one year or more after date of issue. Accordingly, the payment of dividends out of current net income is at present unrestricted under these conditions.

### **Voting Rights**

Except as hereinafter set forth, every holder of Common Stock has one vote for each share and the holders of Preferred Stock have no voting power.

Holders of Preferred Stock are entitled to vote on certain matters relating to changes in the capital structure of the Company, authorization of stock ranking prior to or on a parity with Preferred Stock, changes in the express terms of any Preferred Stock in a manner prejudicial to its holders, and certain other matters. The matters upon which the holders of Preferred Stock are entitled to vote, and the vote required, are set forth in Article III of the amended Articles of Incorporation.

If there is a default in the payment of dividends on the Preferred Stock in an amount equal to four full quarterly dividends and until all dividends in default shall have been paid or declared and funds set aside for payment, (a) each share of Preferred Stock is entitled to one vote per share, and each share of Common Stock is entitled to one-half vote per share, on all matters other than the election of directors, and (b) the holders of the Preferred Stock are entitled as a class to elect a majority of the

Board of Directors and the holders of the Common Stock are entitled as a class to elect the remaining directors.

No shareholder has cumulative voting rights.

### **Liquidation Rights**

In the event of the Company's dissolution or liquidation, the holders of Preferred Stock are entitled to receive (a) the par value of their Preferred Stock out of the corporate assets other than profits before any of such assets are paid or distributed to the holders of Common Stock and (b) the amount of dividends accumulated and unpaid on their Preferred Stock out of the surplus or net profits before any of such surplus or net profits are paid to the holders of Common Stock. Thereafter, the remainder of the corporate assets, surplus and net profits shall be paid to the holders of the Common Stock.

### **Preemptive Rights**

No holder of shares of any class of the Company's stock has any preemptive or subscription rights, except that if the Board of Directors desires to offer for money any new or additional Common Stock, or any security convertible into Common Stock, other than by a public offering, the same shall first be offered pro-rata to the holders of Common Stock.

### **Conversion Rights, Redemption Provisions, and Sinking Fund Provisions**

The Common Stock of the Company is not convertible, and is not redeemable, and the holders of shares of Common Stock are not entitled to the benefit of any sinking fund provision.

### **Liability to Further Calls or to Assessment**

The shares of Common Stock offered hereby, when issued and delivered by the Company and paid for as herein contemplated, will be fully-paid and non-assessable by the Company. However, the Wisconsin statutes impose a liability on shareholders, not exceeding the par value of their stock, for all debts owing to employees of the Company for services performed, but not exceeding six months service in any one case.

#### **Transfer Agents**

First Wisconsin Trust Company  
735 North Water Street  
Milwaukee, Wisconsin 53201

Irving Trust Company  
One Wall Street  
New York, New York 10015

#### **Registrars**

Marshall & Ilsley Bank  
Milwaukee, Wisconsin

The Chase Manhattan Bank (N.A.)  
New York, New York

## LEGAL OPINIONS AND EXPERTS

Opinions as to legality of the additional Common Stock will be rendered by Messrs. Froelich, Grossman, Teton and Tabin, 120 South LaSalle Street, Chicago, Illinois 60603, and Messrs. Foley & Lardner, 735 North Water Street, Milwaukee, Wisconsin 53202, counsel for the Company, and by Messrs. Schiff Hardin Waite Dorschel & Britton, 231 South LaSalle Street, Chicago, Illinois 60604, counsel for the Underwriters.

William J. Froelich, who is associated with the firm of Froelich, Grossman, Teton and Tabin, is a Director and member of the Executive Committee of the Company, is its Legal Counsel and is receiving retirement benefits. As of September 30, 1971, he held 1,144 shares of its Common Stock. The firm of Foley & Lardner have advised the Company that, as of the same date, one member of such firm who has participated in the preparation of this Prospectus and the Registration Statement and who will participate in the rendition of such firm's opinions, had the following interests in securities of the Company: 3,140 shares of Common Stock owned either directly by such member or his spouse or held in a trust for the benefit of members of his immediate family.

The financial statements included in this Prospectus have been examined by Arthur Andersen & Co., independent public accountants, as indicated in their report with respect thereto, and are included herein in reliance upon the authority of said firm as experts in making such examinations and in giving said report.

**BALANCE SHEETS—DECEMBER 31, 1970 AND AUGUST 31, 1971**

**ASSETS**

	<u>Dec. 31, 1970</u>	<u>Aug. 31, 1971 (Unaudited)</u>
<b>UTILITY PLANT (at original cost):</b>		
In service—		
Electric .....	\$260,432,287	\$272,285,476
Gas .....	66,191,719	67,167,329
Bus .....	606,646	717,959
	<u>327,230,652</u>	<u>340,170,764</u>
Less—Accumulated provision for depreciation (Note 9) .....	100,966,289	108,237,791
	<u>226,264,363</u>	<u>231,932,973</u>
Construction in progress (Note 14) .....	39,534,937	60,464,097
Nuclear fuel .....	3,477,077	6,937,396
	<u>269,276,377</u>	<u>299,334,466</u>
<b>INVESTMENTS (at cost or less):</b>		
Wisconsin River Power Company (one-third interest) (Note 7) .....	3,103,018	3,103,018
Other investments .....	429,163	428,863
Nonutility property .....	1,360,956	1,518,912
	<u>4,893,137</u>	<u>5,050,793</u>
<b>CURRENT ASSETS:</b>		
Cash .....	2,683,914	2,474,318
Temporary cash investments .....	1,750,000	700,000
Special deposits (including \$19,470,000 on deposit at December 31, 1970 to retire 3¼% First Mortgage Bonds due January 1, 1971) .....	20,289,341	1,763,829
Customer accounts and other receivables (less reserves of \$209,462 and \$185,756) ..	9,413,998	8,321,697
Materials, supplies and fuel, at average cost .....	9,832,238	11,475,328
Prepayments .....	252,021	122,232
	<u>44,221,512</u>	<u>24,857,404</u>
<b>DEFERRED CHARGES:</b>		
Debt discount and expense on outstanding bonds .....	1,553,266	1,753,092
Miscellaneous .....	897,839	870,631
	<u>2,451,105</u>	<u>2,623,723</u>
	<u>\$320,842,131</u>	<u>\$331,866,386</u>

**CAPITALIZATION AND LIABILITIES**

<b>SHAREHOLDERS' INVESTMENT (see page 19):</b>		
Common stock equity .....	\$ 87,865,035	\$ 89,764,776
Preferred stock .....	36,200,000	36,200,000
<b>FIRST MORTGAGE BONDS (see page 19) .....</b>	<u>153,000,000</u>	<u>176,337,000</u>
Total capitalization .....	277,065,035	302,301,776
<b>NOTES PAYABLE AND COMMERCIAL PAPER (see page 19) .....</b>	8,830,000	5,900,000
Total capitalization, notes payable and commercial paper .....	<u>285,895,035</u>	<u>308,201,776</u>
<b>CURRENT LIABILITIES (exclusive of notes payable and commercial paper):</b>		
3¼% First Mortgage Bonds due January 1, 1971 .....	19,470,000	—
Accounts payable .....	6,029,694	4,962,810
Accrued taxes .....	1,269,107	8,232,515
Accrued interest .....	3,203,083	3,036,284
Dividends declared .....	—	1,795,023
Other .....	2,420,643	2,710,368
	<u>32,392,527</u>	<u>20,737,000</u>
<b>OTHER CREDITS:</b>		
Premium on outstanding bonds .....	107,939	101,670
Advances and contributions for construction .....	2,151,897	2,312,596
Miscellaneous .....	294,733	513,344
	<u>2,554,569</u>	<u>2,927,610</u>
<b>CONSTRUCTION AND PURCHASE COMMITMENTS (Notes 5 and 7) .....</b>	<u>\$320,842,131</u>	<u>\$331,866,386</u>

The accompanying Notes to Financial Statements are an integral part of these balance sheets.

**STATEMENTS OF CAPITALIZATION—DECEMBER 31, 1970 AND AUGUST 31, 1971**

	<u>Dec. 31, 1970</u>	<u>Aug. 31, 1971 (Unaudited)</u>
<b>SHAREHOLDERS' INVESTMENT:</b>		
Common stock equity—		
Common stock, \$8 par value, 7,000,000 shares authorized; 6,189,734 shares outstanding (Note 1) .....	\$ 49,517,872	\$ 49,517,872
Premium on capital stock (Note 1) .....	4,981,485	4,981,485
Earnings reinvested in the business (Note 2) .....	<u>33,365,678</u>	<u>35,265,419</u>
	<u>87,865,035</u>	<u>89,764,776</u>
Preferred stock, cumulative, \$100 par value, 600,000 shares authorized (Note 3)—		
5% series, 132,000 shares outstanding .....	13,200,000	13,200,000
5.04% series, 30,000 shares outstanding .....	3,000,000	3,000,000
5.08% series, 50,000 shares outstanding .....	5,000,000	5,000,000
6.76% series, 150,000 shares outstanding .....	<u>15,000,000</u>	<u>15,000,000</u>
	<u>36,200,000</u>	<u>36,200,000</u>
<b>FIRST MORTGAGE BONDS (Note 4):</b>		
Long term—		
3% series due 1977 .....	2,964,000	2,964,000
3 $\frac{1}{8}$ % series due 1978 .....	2,877,000	2,877,000
2 $\frac{7}{8}$ % series due 1979 .....	2,756,000	2,656,000
2 $\frac{7}{8}$ % series due 1980 .....	2,781,000	2,781,000
3 $\frac{1}{4}$ % series due 1984 .....	10,594,000	10,222,000
4 $\frac{3}{8}$ % series due 1987 .....	6,032,000	6,009,000
4 $\frac{3}{8}$ % series due 1993 .....	14,064,000	13,846,000
4 $\frac{1}{2}$ % series due 1994 .....	16,893,000	16,873,000
6 $\frac{3}{8}$ % series due 1997 .....	24,251,000	23,949,000
7 $\frac{1}{4}$ % series due 1999 .....	24,788,000	24,160,000
9 $\frac{1}{4}$ % series due 2000 .....	45,000,000	45,000,000
8 $\frac{1}{4}$ % series due 2001 .....	—	25,000,000
Total first mortgage bonds .....	<u>153,000,000</u>	<u>176,337,000</u>
Total capitalization .....	<u>277,065,035</u>	<u>302,301,776</u>
<b>NOTES PAYABLE AND COMMERCIAL PAPER</b>		
(Notes 1 and 12) .....	<u>8,830,000</u>	<u>5,900,000</u>
Total capitalization, notes payable and commercial paper ..	<u>\$285,895,035</u>	<u>\$308,201,776</u>

The accompanying Notes to Financial Statements are an integral part of these statements.

**STATEMENTS OF SURPLUS**

	Year Ended December 31					Twelve Months Ended August 31, 1971 (Unaudited)
	1966	1967	1968	1969	1970	
<b>EARNINGS REINVESTED IN THE BUSINESS</b>						
BALANCE AT BEGINNING OF PERIOD .....	\$19,875,826	\$23,459,235	\$26,894,728	\$29,301,940	\$31,201,321	\$31,983,255
ADD:						
Net income .....	9,378,709	9,845,018	9,447,068	10,277,660	11,360,384	12,266,084
Income tax reduction, net of cost of investments, arising from contribution to Wisconsin Public Service Foundation, Inc.	300,661	300,460	—	—	—	—
Net profit on sale of land .....	—	—	13,795	—	—	—
	<u>9,679,370</u>	<u>10,145,478</u>	<u>9,460,863</u>	<u>10,277,660</u>	<u>11,360,384</u>	<u>12,266,084</u>
	<u>29,555,196</u>	<u>33,604,713</u>	<u>36,355,591</u>	<u>39,579,600</u>	<u>42,561,705</u>	<u>44,249,339</u>
DEDUCT:						
Cash dividends declared—						
Preferred stock—						
5% series (\$5.00* per share) .....	660,000	660,000	660,000	660,000	660,000	495,000
5.04% series (\$5.04* per share) .....	151,200	151,200	151,200	151,200	151,200	113,400
5.08% series (\$5.08* per share) .....	254,000	254,000	254,000	254,000	254,000	190,500
6.76% series (\$7.04 [including initial dividend of \$1.97] \$6.76 and \$6.76* per share in the respective periods) .....	—	—	—	1,056,255	1,014,000	760,500
Common stock, at rate of 90¢, 98¢, \$1.06, \$1.10, \$1.13 and \$1.16 per share in the respective periods .....	5,030,761	5,477,939	5,925,118	6,148,707	6,829,399	7,180,092
Expense of issuing additional capital stock .....	—	—	63,333	77,888	54,497	—
Utility plant acquisition adjustment on property purchased in 1967 .....	—	166,846	—	—	—	—
Establishment of amortization reserve on licensed hydroelectric projects pursuant to order of Federal Power Commission	—	—	—	—	232,931	244,428
Miscellaneous .....	—	—	—	30,229	—	—
	<u>6,095,961</u>	<u>6,709,985</u>	<u>7,053,651</u>	<u>8,378,279</u>	<u>9,196,027</u>	<u>8,983,920</u>
BALANCE AT CLOSE OF PERIOD (Note 2) .....	<u>\$23,459,235</u>	<u>\$26,894,728</u>	<u>\$29,301,940</u>	<u>\$31,201,321</u>	<u>\$33,365,678</u>	<u>\$35,265,419</u>

**PREMIUM ON CAPITAL STOCK**

BALANCE AT BEGINNING OF PERIOD .....	\$ —	\$ —	\$ —	\$ 79,485	\$ 79,485	\$ 4,981,485
ADD—Premium on issuance of preferred stock .....	—	—	79,485	—	—	—
Premium on issuance of common stock .....	—	—	—	—	4,902,000	—
BALANCE AT CLOSE OF PERIOD .....	<u>\$ —</u>	<u>\$ —</u>	<u>\$ 79,485</u>	<u>\$ 79,485</u>	<u>\$ 4,981,485</u>	<u>\$ 4,981,485</u>

\* Annual rates are as stated except that due to the timing of Board of Directors meetings only three quarterly dividends were declared during the twelve months ended August 31, 1971.

The accompanying Notes to Financial Statements are an integral part of these statements.

**STATEMENTS OF CHANGES IN FINANCIAL POSITION**

	Year Ended December 31					Twelve Months Ended August 31, 1971
	1966	1967	1968	1969	1970	(Unaudited)
<b>FUNDS GENERATED</b>						
<b>INTERNALLY:</b>						
Net income .....	\$ 9,378,709	\$ 9,845,018	\$ 9,447,068	\$10,277,660	\$11,360,384	\$12,266,084
Depreciation .....	7,710,181	8,146,819	8,897,338	9,930,074	10,883,940	11,611,703
Funds provided from operations .....	17,088,890	17,991,837	18,344,406	20,207,734	22,244,324	23,877,787
Less—						
Cash dividends—						
Preferred stock .....	(1,065,200)	(1,065,200)	(1,065,200)	(2,121,455)	(2,079,200)	(1,559,400)
Common stock .....	(5,030,761)	(5,477,939)	(5,925,118)	(6,148,707)	(6,829,399)	(7,180,092)
Bond sinking fund retirements	(1,077,000)	(824,000)	(939,000)	(1,356,000)	(1,838,000)	(1,934,000)
Net funds generated internally .....	9,915,929	10,624,698	10,415,088	10,581,572	11,497,725	13,204,295
<b>FUNDS OBTAINED FROM OUTSIDE FINANCING:</b>						
Sale of first mortgage bonds ...	—	25,000,000	—	25,000,000	45,000,000	25,000,000
Deposit for retirement of bonds	—	—	—	—	(19,470,000)	—
Net funds from sale of first mortgage bonds ..	—	25,000,000	—	25,000,000	25,530,000	25,000,000
Sale of preferred stock .....	—	—	15,000,000	—	—	—
Sale of common stock .....	—	—	—	—	9,702,000	—
Increase (decrease) in short-term borrowings .....	6,350,000	(10,950,000)	10,400,000	1,150,000	(3,720,000)	5,900,000
Net funds obtained from outside financing ....	6,350,000	14,050,000	25,400,000	26,150,000	31,512,000	30,900,000
<b>OTHER SOURCES (USES) OF FUNDS:</b>						
Changes in working capital—						
Cash and temporary cash investments .....	(246,056)	241,744	(336,165)	(840,163)	(971,354)	10,778,980
Special deposits (in 1970 and 1971 net of \$19,470,000 deposit for retirement of 3¼ % First Mortgage Bonds due January 1, 1971) ....	894	(963,940)	(402,528)	(160,620)	1,035,737	(620,642)
Customer accounts and other receivables .....	(113,353)	(462,644)	(1,205,398)	(244,639)	(1,711,356)	(646,402)
Materials, supplies and fuel ..	(1,172,189)	(231,221)	(938,170)	549,803	(2,226,787)	(2,265,720)
Accrued interest .....	7,607	218,381	36,990	464,842	1,672,900	555,592
Accounts payable .....	356,109	688,991	1,456,419	398,037	476,151	519,882
Accrued taxes .....	(1,132,818)	(1,147,172)	(776,244)	185,298	(324,055)	1,243,978
Other (net) .....	(316,340)	473,075	219,037	163,925	63,126	507,099
Decrease (increase) in working capital .....	(2,616,146)	(1,182,786)	(1,946,059)	516,483	(1,985,638)	10,072,767
Decrease (increase) in investments, deferred charges, etc.—net .....	296,105	404,569	1,292,283	(586,437)	(804,613)	(634,671)
Net other sources (uses) of funds .....	(2,320,041)	(778,217)	(653,776)	(69,954)	(2,790,251)	9,438,096
<b>TOTAL FUNDS USED FOR CONSTRUCTION EXPENDITURES AND NUCLEAR FUEL .....</b>	<b>\$13,945,888</b>	<b>\$23,896,481</b>	<b>\$35,161,312</b>	<b>\$36,661,618</b>	<b>\$40,219,474</b>	<b>\$53,542,391</b>

The accompanying Notes to Financial Statements are an integral part of these statements.

## NOTES TO FINANCIAL STATEMENTS

(Including Notes Applicable to the Unaudited Period)

**(1) Sale of additional Common Stock—**

Reference is made to the statements under "Use of Proceeds and Construction Program" with respect to the Company's proposed sale of additional Common Stock, the use of the proceeds from the sale, notes payable to banks and commercial paper.

**(2) Limitation on common stock dividends—**

The Articles of Incorporation of the Company include provisions limiting the payment of dividends on common stock to 75% of net income available therefor if the ratio of common stock equity to total capitalization is less than 25%, and to 50% of such net income if such ratio is less than 20%. At December 31, 1970, and August 31, 1971, common stock dividend payments were not restricted. At August 31, 1971, after giving effect to the sale of the additional Common Stock, the ratio of common stock equity to total capitalization, as defined, would be approximately 32%.

**(3) Preferred stock redemption prices—**

The preferred stock is subject to redemption as a whole or in part at the Company's option on any date, on 30 days' notice, at the following prices per share, plus accrued dividends: 5% Series, \$107.50; 5.04% Series, \$102.81; 5.08% Series, \$102.00 if redeemed prior to November 1, 1973, and \$101.00 if redeemed on or after November 1, 1973; 6.76% Series, \$108.42 if redeemed prior to November 1, 1973 (subject until then to limitations on refunding at a lower cost of money), \$106.73 if redeemed on or after November 1, 1973, and prior to November 1, 1978, \$105.04 if redeemed on or after November 1, 1978, and prior to November 1, 1983, and \$103.35 if redeemed on or after November 1, 1983.

**(4) Sinking fund requirements and redemption provisions—**

Sinking fund deposits of \$1,040,000 are required in 1971, \$1,290,000 in 1972, \$1,740,000 in 1973, and \$1,990,000 in 1974 and 1975 for the redemption of outstanding first mortgage bonds. As of August 31, 1971, the Company had satisfied all of its requirements due in 1971, \$1,248,000 of those due in 1972, \$961,000 of those due in 1973, \$461,000 of those due in 1974, and \$118,000 of those due in 1975.

First Mortgage Bonds due in 1997 and subsequent years cannot be redeemed for five years after date of issuance at an interest cost to the Company of less than the expressed annual interest rate of the bonds.

**(5) Construction commitments—**

The Company's construction program for 1971 and 1972 involves estimated expenditures of \$92,000,000, and substantial commitments have been made in connection therewith, including the Company's proportional share of construction of joint power facilities, to which reference is made under "Use of Proceeds and Construction Program".

**(6) Employees' Retirement Plan—**

The Company has an Employees' Retirement Plan, maintained without cost to its employees, under which annual contributions are made to an irrevocable trust established to provide retired employees with a monthly pension if conditions relating to age and length of service have been met. The Company's policy is to fund pension plan costs accrued. Pension plan costs were \$1,270,000,

**NOTES TO FINANCIAL STATEMENTS (Continued)**

**(Including Notes Applicable to the Unaudited Period)**

\$1,260,000, \$1,171,000, \$1,300,000, \$1,375,000 and \$1,650,000, respectively, for the years 1966 through 1970 and the twelve months ended August 31, 1971. Since January 1, 1968, pension plan costs applicable to construction have been capitalized, and amounted to \$208,000, \$226,000, \$249,000 and \$289,000, respectively, of the total pension plan costs for 1968, 1969, 1970 and the twelve months ended August 31, 1971. As of August 31, 1971, past service costs have been fully funded.

**(7) Wisconsin River Power Company—**

Under a contract for a minimum term to 1977, the Company is entitled and required to purchase, at rates which are subject to adjustment for the seller's operating and financing requirements, one-third of the power generated by Wisconsin River Power Company's two hydro-electric generating plants, which have a total installed capacity of 35,000 kilowatts.

**(8) Maintenance—**

The accounting policies followed with respect to maintenance, repairs, renewals and betterments are in accordance with the Uniform System of Accounts prescribed by the Public Service Commission of Wisconsin. Maintenance and repair costs are charged directly to the income account except for such costs which are charged to transportation, stores expense, or other clearing accounts and redistributed from these accounts, together with other charges, to various operating, construction and other accounts. The latter amounts so charged are not significant. The cost of renewals and betterments of units of property (as distinguished from minor items of property) is charged to utility plant accounts. Property units retired or otherwise disposed of in the normal course of business are charged to the accumulated provision for depreciation, and salvage, less removal cost, is credited thereto.

**(9) Depreciation—**

Depreciation provisions are computed on a straight-line basis, applying rates approved by the Public Service Commission of Wisconsin to depreciable property. The Company is providing additional depreciation, as authorized by the Wisconsin Commission, equivalent to the estimated reduction in federal income taxes resulting from liberalized depreciation under Section 167 of the Internal Revenue Code. Depreciation provisions, excluding this additional depreciation, were equivalent to the following annual composite rates:

Department	Year Ended December 31				
	1966	1967	1968	1969	1970
Electric—					
Power—					
Hydro .....	1.91%	1.91%	1.92%	2.95%	2.95%
Other .....	2.80	2.80	2.79	2.68	2.83
Distribution .....	2.85	2.85	2.85	2.85	2.84
Gas .....	2.30	2.30	2.30	2.57	2.63
Bus .....	2.13	3.25	4.09	4.53	4.68
General .....	3.36	3.37	3.37	3.28	3.10

**NOTES TO FINANCIAL STATEMENTS (Continued)**

**(Including Notes Applicable to the Unaudited Period)**

The additional depreciation referred to above amounted to \$1,185,000, \$1,266,000, \$1,506,000, \$1,668,000, \$1,668,000 and \$1,680,000, respectively, for the years 1966 through 1970 and the twelve months ended August 31, 1971. As of August 31, 1971, such additional depreciation aggregated \$15,662,000.

**(10) Investment credit—**

As a result of the 3% investment credit, federal income taxes were reduced \$370,000, \$330,000, \$598,000, \$773,000, \$99,000 and \$158,000, respectively, for the years 1966 through 1970 and the twelve months ended August 31, 1971, in accordance with the requirements of the Public Service Commission of Wisconsin.

**(11) Supplementary income account information—**

The amounts of depreciation and taxes charged to (a) expenses other than statement of income captions and (b) other accounts, are not significant. Rents of buildings and similar items charged to miscellaneous income captions and clearing accounts are not significant. No royalties were paid.

The following tabulation sets forth significant taxes charged to tax expense, other than income taxes and taxes charged to clearing and other accounts:

	Year Ended December 31					Twelve Months Ended August 31, 1971 (Unaudited)
	1966	1967	1968	1969	1970	
Real estate and personal property .....	\$4,565,110	\$4,850,054	\$5,524,217	\$6,307,255	\$7,035,808	\$7,844,008
Payroll .....	384,926	455,894	492,696	533,476	570,233	630,933
Other .....	69,964	74,052	76,087	81,269	87,959	97,059
<b>TOTAL .....</b>	<b>\$5,020,000</b>	<b>\$5,380,000</b>	<b>\$6,093,000</b>	<b>\$6,922,000</b>	<b>\$7,694,000</b>	<b>\$8,572,000</b>

**(12) Notes payable and commercial paper—**

At August 31, 1971, the Company had unsecured lines of bank credit under various arrangements totalling \$24,988,000 of which the unused credit amounted to \$21,488,000. The loans under these lines of credit are generally due in 90 days and bear interest at the "prime rate" in effect at the time the loans are made. The rates on outstanding bank loans were 6¾% and 7% at December 31, 1970, and 6% at August 31, 1971. Under these various credit arrangements, the Company is required to maintain certain compensating balances.

At August 31, 1971, the Company had \$2,400,000 principal amount of commercial paper outstanding at annual discount rates of 5½% to 5¾%, with maturities ranging from 38 to 55 days from date of issuance.

**NOTES TO FINANCIAL STATEMENTS (Continued)**

**(Including Notes Applicable to the Unaudited Period)**

**(13) Rate increases—**

Reference is made to "Rate Proceedings."

**(14) Nuclear generating plant under construction—**

Construction work in progress includes \$42,458,000 at August 31, 1971, relating to the Company's 41.2% interest in the Kewaunee Nuclear Plant. Reference is made to "Use of Proceeds and Construction Program" and to "Business—Regulation" for further information relating to the status of this plant.

**REPORT OF INDEPENDENT PUBLIC ACCOUNTANTS**

To Wisconsin Public Service Corporation:

We have examined the balance sheet and statement of capitalization of WISCONSIN PUBLIC SERVICE CORPORATION (a Wisconsin corporation) as of December 31, 1970, and the related statements of income, surplus and changes in financial position for the five years then ended. Our examinations were made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying financial statements referred to above present fairly the financial position of Wisconsin Public Service Corporation as of December 31, 1970, and the results of its operations and changes in financial position for the five years then ended, in conformity with generally accepted accounting principles consistently applied during the periods.

ARTHUR ANDERSEN & CO.

Milwaukee, Wisconsin,  
February 5, 1971.

## UNDERWRITING

The several Underwriters, represented by Merrill Lynch, Pierce, Fenner & Smith Incorporated and Robert W. Baird & Co. Incorporated (the "Representatives"), have severally agreed, subject to the terms and conditions of the Underwriting Agreement, a copy of which is filed as an exhibit to the Registration Statement, to purchase from the Company the respective number of shares of the additional Common Stock set forth below:

<u>Underwriter</u>	<u>Address</u>	<u>Number of Shares</u>
Merrill Lynch, Pierce, Fenner & Smith Incorporated .....	70 Pine Street, New York, N. Y. 10005	110,000
Robert W. Baird & Co. Incorporated .....	731 North Water Street, Milwaukee, Wisconsin 53201	110,000
Blyth & Co., Inc. ....	14 Wall Street, New York, N. Y. 10005	16,000
The First Boston Corporation .....	20 Exchange Place, New York, N. Y. 10005	16,000
duPont Gloré Forgan Incorporated .....	One Wall Street, New York, N. Y. 10005	16,000
Eastman Dillon, Union Securities & Co. Incorporated .....	One Chase Manhattan Plaza, New York, N. Y. 10005	16,000
Halsey, Stuart & Co. Inc. ....	123 South La Salle Street, Chicago, Illinois 60690	16,000
Hornblower & Weeks-Hemphill, Noyes .....	8 Hanover Street, New York, N. Y. 10004	16,000
Kidder, Peabody & Co. Incorporated .....	20 Exchange Place, New York, N. Y. 10005	16,000
Paine, Webber, Jackson & Curtis Incorporated .....	140 Broadway, New York, N. Y. 10005	16,000
Salomon Brothers .....	One New York Plaza, New York, N. Y. 10004	16,000
Smith, Barney & Co. Incorporated .....	1345 Avenue of the Americas, New York, N. Y. 10019	16,000
White, Weld & Co. ....	20 Broad Street, New York, N. Y. 10005	16,000
Dean Witter & Co. Incorporated .....	14 Wall Street, New York, N. Y. 10005	16,000
Bache & Co. Incorporated .....	100 Gold Street, New York, N. Y. 10038	16,000
E. F. Hutton & Company Inc. ....	One Battery Park Plaza, New York, N. Y. 10004	16,000
Reynolds Securities Inc. ....	120 Broadway, New York, N. Y. 10005	16,000
Shearson, Hammill & Co. Incorporated .....	14 Wall Street, New York, N. Y. 10005	16,000
A. G. Becker & Co. Incorporated .....	60 Broad Street, New York, N. Y. 10004	10,000
CBWL-Hayden, Stone Inc. ....	767 Fifth Avenue, New York, N. Y. 10022	10,000
Equitable Securities, Morton & Co. Incorporated .....	65 Broadway, New York, N. Y. 10006	10,000
W. E. Hutton & Co. ....	14 Wall Street, New York, N. Y. 10005	10,000
F. S. Moseley & Co. ....	60 Broad Street, New York, N. Y. 10004	10,000
Walston & Co., Inc. ....	77 Water Street, New York, N. Y. 10005	10,000
Wood, Struthers & Winthrop Inc. ....	20 Exchange Place, New York, N. Y. 10005	10,000
Bacon, Whipple & Co. ....	135 South La Salle Street, Chicago, Illinois 60603	6,500
Ball, Burge & Kraus .....	1414 Union Commerce Bldg., Cleveland, Ohio 44115	6,500
William Blair & Company .....	135 South La Salle Street, Chicago, Illinois 60603	6,500
Blunt Ellis & Simmons Incorporated .....	111 West Monroe Street, Chicago, Illinois 60603	6,500
The Chicago Corporation .....	208 South La Salle Street, Chicago, Illinois 60604	6,500
Dain, Kalman & Quail, Incorporated .....	100 Dain Tower, Minneapolis, Minnesota 55402	6,500
First of Michigan Corporation .....	2 Wall Street, New York, N. Y. 10005	6,500
Loewi & Co. Incorporated .....	225 East Mason Street, Milwaukee, Wisconsin 53202	6,500
McDonald & Company .....	2100 Central National Bank Bldg., Cleveland, Ohio 44114	6,500