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Vissing, G.

~~Rochester Gas & Electric Corp.~~
NRL

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As we discussed on the phone today, here is a summary of an editorial error within the Improved Technical Specifications (ITS) which we believe is a candidate for correction outside the license amendment process. Enclosed are three sets of documents as follows:

1. Section A - this contains page 3.5-10 of the "old" TS. As can be seen for function 3.e, the instrumentation for "Trip of Both Feedwater Pumps Starts Motor Driven AFW Pumps" was required to be operable above 5% power (this equates to MODE 1 in the ITS as shown on page 1.1-7 of the ITS).
2. Section B - this contains page 3.3-27 of the ITS. As can be seen for function 6.f; the instrumentation for "Trip of Both Main Feedwater Pumps (Motor driven AFW pumps only)" is required to be operable in MODES 1 and 2. This increased applicability is consistent with NUREG-1431 (i.e., NUREG-1431 has an applicability of MODES 1 and 2 for this function).
3. Section C - this contains the marked up "old" TS along with the justification pages included within the December 28, 1995 submittal. As can be seen, RG&E did not intend to change the applicability to include MODE 2.

Essentially, the NUREG-1431 (and the electronic copy of NUREG-1431 used for Ginna Station's ITS) require the associated function for both MODES 1 and 2 while the "old" TS only require it for MODE 1. RG&E inadvertently failed to update the electronic copy of NUREG-1431 to make it applicable to only MODE 1. NUREG-1431 was written for a 4-loop / Westinghouse plant which must use the MFW pumps prior to reaching MODE 2 to provide the necessary core cooling. In a 2-loop plant like Ginna, the AFW pumps provide the necessary core cooling until approximately 4% power at which time the MFW pumps are placed into service. In order to implement the ITS, RG&E has been forced to "jumper" the necessary AFW start instrumentation as documented in a forthcoming LER (#96-008). Therefore, the applicability for this function should be changed to MODE 1.

Mark
Mark Flaherty
(716) 724-8512

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PDR

PDR: per G. Vissing

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"OLD" TS

TABLE 3.5-2 (Continued)
ENGINEERED SAFETY FEATURE ACTUATION INSTRUMENTATION

NO. FUNCTIONAL UNIT	1 TOTAL NO. of CHANNELS	2 NO. of CHANNELS TO TRIP	3 MIN. OPERABLE CHANNELS	4 PERMISSIBLE BYPASS CONDITIONS	5 OPERATOR ACTION IF CONDITIONS OF COLUMN 1 OR 3 CANNOT BE MET	6 CHANNEL OPERABLE ABOVE
3. <u>AUXILIARY FEEDWATER</u> <u>Motor and Turbine Driven</u>						
a. Manual	1/pump	1/pump	1/pump		8	$T_{RCS} = 350^{\circ}\text{F}$
b. Stm. Gen. Water Level-low-low						
i. Start Motor Driven Pumps	3/stm.gen.	2/stm.gen. either gen.	2/stm.gen. both gen.		9	$T_{RCS} = 350^{\circ}\text{F}$
ii. Start Turbine Driven Pump	3/stm.gen.	2/stm.gen. both gen.	2/stm.gen. either gen.		12	$T_{RCS} = 350^{\circ}\text{F}$
c. Loss of 4 KV Voltage Start Turbine Driven Pump	2/bus	1/bus (both buses)	2/bus (either bus)		12	$T_{RCS} = 350^{\circ}\text{F}$
d. Safety Injection Start Motor Driven Pumps		(see Item 1)				
e. Trip of both Feed- water Pumps starts Motor Driven Pumps	2/pump	1/pump both pumps	2/pump either pump		6	5% power
<u>Standby Motor Driven</u>						
a. Manual	1/pump	1/pump	1/pump		8	$T_{RCS} = 350^{\circ}\text{F}$

ITS



Table 3.3.2-1 (page 3 of 3)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
5. Feedwater Isolation						
a. Automatic Actuation Logic and Actuation Relays	1,2(c),3(c)	2 trains	E,G	SR 3.3.2.7	NA	NA
b. SG Water Level -High	1,2(c),3(c)	3 per SG	F,G	SR 3.3.2.1 SR 3.3.2.2 SR 3.3.2.5	≤ 94%	≤ 85%
c. Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.					
6. Auxiliary Feedwater (AFW)						
a. Manual Initiation						
AFW	1,2,3	1 per pump	N	SR 3.3.2.4	NA	NA
Standby AFW	1,2,3	1 per pump	N	SR 3.3.2.4	NA	NA
b. Automatic Actuation Logic and Actuation Relays	1,2,3	2 trains	E,G	SR 3.3.2.7	NA	NA
c. SG Water Level -Low Low	1,2,3	3 per SG	D,G	SR 3.3.2.1 SR 3.3.2.2 SR 3.3.2.5	≥ 16%	≥ 17%
d. Safety Injection (Motor driven pumps only)	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.					
e. Undervoltage -Bus 11A and 11B (Turbine driven pump only)	1,2,3	2 per bus	D,G	SR 3.3.2.3 SR 3.3.2.5	≥ 2450 V with ≤ 3.6 sec time delay	≥ 2579 V with ≤ 3.6 sec time delay
f. Trip of Both Main Feedwater Pumps (Motor driven pumps only)	1,2	2 per MFW pump	B,C	SR 3.3.2.4	NA	NA

(c) Except when all Main Feedwater Regulating and associated bypass valves are closed and de-activated or isolated by a closed manual valve.

12/28/95 Submitted

ii. The following changes were made to TS 3.5.2, Table 3.5-2, or Table 3.5-4:

- a. TS 3.5.2.2, 3.5.2.3 and Table 3.5-2, Columns 1, 2, and 3 - The details describing the operability acceptance criteria for Trip Setpoints including the columns for the "Total Number of Channels," the "Number of Channels to Trip," and the "Minimum Operable Channels" were not added for each of the functional units. The columns were replaced with a new column denoting "Required Channels." System design and operational details are not directly related to the operability of the instrumentation and were relocated to the bases or are described in the UFSAR. This is a Ginna TS Category (iii) change.
- b. Table 3.5-2, Column 6 - The column for the "Channel Operable Above" was revised consistent with the changes to the Mode table definitions in ITS Chapter 1.0. Changes to the Applicability different from those discussed in Chapter 1.0 are discussed with the specific changes to the Functional Units. This is a Ginna TS Category (vi) change.
- c. Table 3.5-2, Functional Unit #1.b - The Mode of Applicability was revised to be RCS > 200°F. The SI High Containment Pressure Function is used to actuate containment isolation below 350°F such that this Function must be operable. The Manual SI Function does not actuate Containment Isolation while the remaining functions are blocked when RCS pressure is < 2000 psig. This is a Ginna TS Category (v.a) change.
- d. Table 3.5-2, Functional Units #1.c and #1.d - The notes or remarks which describe operational details for the Pressurizer Pressure interlock, were reformatted as Mode Applicabilities and default conditions in the new specifications. A new SR 3.3.2.6, was added to specifically denote the operability requirements for the Pressurizer Pressure interlock. This is a Ginna TS Category (iii) change.

Since there is no other changes identified in this column for Function 3.e, no change to the applicability was intended

TABLE 3.5-2 (Continued)
ENGINEERED SAFETY FEATURE ACTUATION INSTRUMENTATION

NO. FUNCTIONAL UNIT	TOTAL NO. of CHANNELS	NO. of CHANNELS TO TRIP	MIN. OPERABLE CHANNELS	PERMISSIBLE BYPASS CONDITIONS	OPERATOR ACTION IF CONDITIONS OF COLUMN 1 OR 3 CANNOT BE MET	CHANNEL OPERABLE ABOVE
3. <u>AUXILIARY FEEDWATER Motor and Turbine Driven</u> Fu # 6.a a. Manual	1/pump	1/pump	1/pump	Cond N 15.ii.k	Declare pump inoperable per LCO 3.2.5	T _{RCS} = 350°F
Fu # 6.c b. Stm. Gen. Water Level-low-low	3/stm.gen.	2/stm.gen. either gen.	2/stm.gen. both gen.	15.ii.o	12	T _{RCS} = 350°F
Fu # 6.d i. Start Motor Driven Pumps ii. Start Turbine Driven Pump	3/stm.gen.	2/stm.gen. both gen.	2/stm.gen. either gen.	12	12	T _{RCS} = 350°F
Fu # 6.e c. Loss of 4 KV Voltage Start Turbine Driven Pump	2/bus	1/bus (both buses)	2/bus (either bus)	12 15.ii.h	8 15.ii.h	T _{RCS} = 350°F
Fu # 6.c d. Safety Injection Start Motor Driven Pumps	(see Item 1)	(see Item 1)	(see Item 1)			
Fu # 6.e e. Trip of both Feedwater Pumps starts Motor Driven Pumps	2/pump	1/pump both pumps	2/pump either pump	8 15.ii.n	8 15.ii.n	5% power
Fu # 6.a <u>Standby Motor Driven</u> a. Manual	1/pump	1/pump	1/pump	Cond N 15.ii.k	Declare pump inoperable per LCO 3.2.5	T _{RCS} = 350°F

Add Function #6.b, "Automatic Actuation Logic and Actuation Relays"

15.ii.g

15.ii.b

GINNA STATION**STEAM GENERATOR REPLACEMENT PROJECT****FACT SHEET****GINNA STATION**

• Commercial Operation	June 1970
• Power Output	470 MegaWatts (electric)
• Percent of RGE Capacity	50%
• License Period (40 Yrs)	1969 - 2009
• Lifetime Capacity Factor	76.0%
• Recent Capacity Factor (1/83 to 12/95)	83.6%
• Plant Type	Westinghouse Pressurized Water Reactor
• Number of Steam Generators	2
• Tubes Repaired	35%

NEW STEAM GENERATORS

• Manufacturer	Babcock & Wilcox International
• Cost	\$40,000,000
• Weight	316 Tons
• Height	63 ft
• Maximum Diameter	13 ft 6 in
• Tube Material	Inconel 690, Thermally Treated
• Number of Tubes	4765 Each
• Tube Diameter	0.750 in

128 m rem estimate



LAMPSON LTL 1200 SERIES 2A CRANE

• Manufacturer	Neil F. Lampson Co.
• Maximum Lift Capacity	1200 Tons
• Counterweight	1500 Tons
• Boom Length	310 ft
• Mast Length	190 ft
• Stinger Length	120 ft
• Maximum Lift Height (Facade 117 Ft)	185 ft
• Weight of Crane	2600 Tons
• Trucks to Transport	120
• Assembly Time	4 Weeks
• Number of Translift Style Cranes	30
• Value	\$10,000,000
• Number of Operators	4
• Maximum Ground Speed	1/2 Mile per Hr
• Cable Length	6 Miles
• Crane Base Size	36 ft x 160 ft

CONTAINMENT OPENINGS

• Steam Generator A	Hexagon
• Steam Generator B	Hexagon with Slot
• Maximum Diameter	22 ft
• Slot Width	9 ft 6 in
• Slot Length	25 ft 9 in
• Dome Construction	30 in Reinforced Concrete 3 Layers of 2 1/4 in Steel Bar 3/8 in Thick Steel Liner Plate

STEAM GENERATOR LIFT INFORMATION

• Test Lift	445 Tons
• S/G Lift (Includes Rigging)	350 Tons
• S/G Lift Radius	250 ft
• Time for Lift	12 Hrs
• Average Hook Speed	2 ft per min
• Ground Loading	12,900 lbs. per sq ft
• Foundations (Reinforced Concrete)	
- Front	48 ft x 52 ft x 3 ft 9 in
- Rear	50 ft x 80 ft x 3 ft



TRANSPORTATION

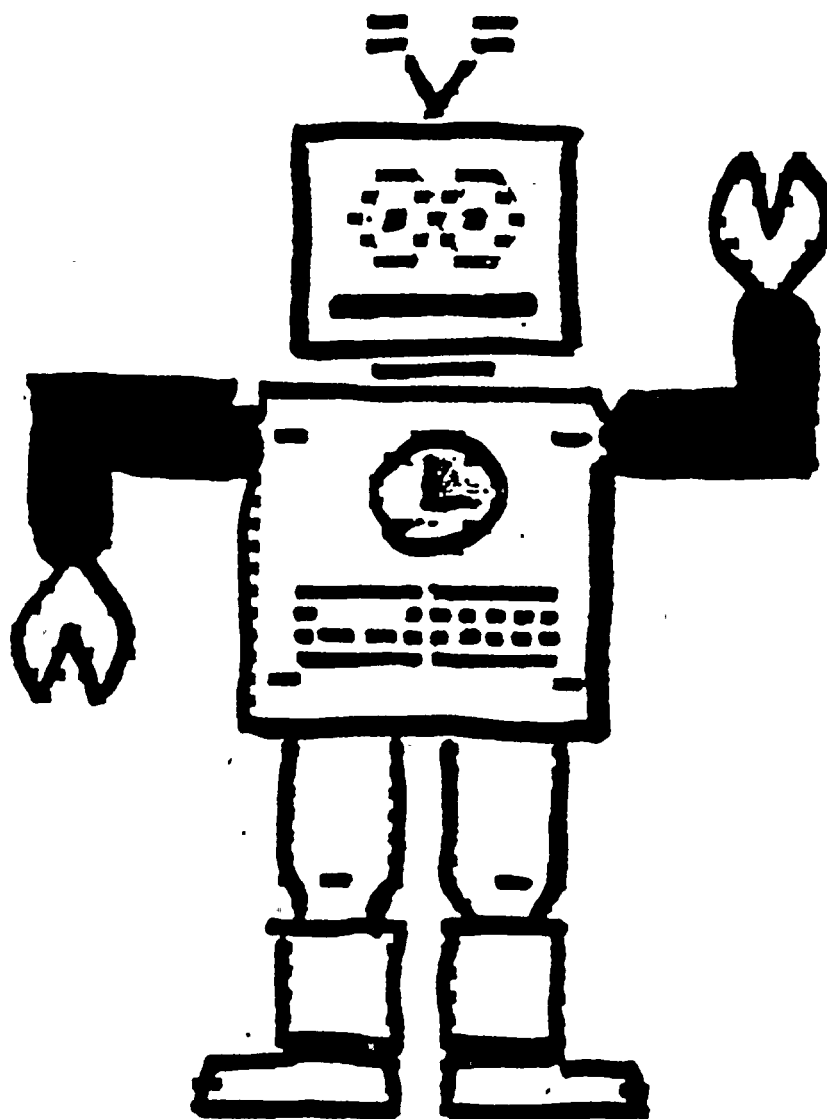
- Route
 - Cambridge, Ont. to Hamilton, Ont. Multi Axle Transporter
 - Hamilton, Ont. to Bear Creek Barge
 - Bear Creek to Ginna Multi Axle Transporter
- Barge (Black Carrier)
 - Size 43 ft x 200 ft
 - Draft 5 ft
 - Powered By 3 - Tugboats
- Transporters (2 Required)
 - Tractors 1 Front, 1 Rear
 - Length (Including Tractors) 153 ft 2 in / 143 ft 4 in
 - Width 21 ft
 - Tires 224 / 192
 - Axles 14 / 12
 - Speed (Average) 1 Mile per Hr
 - Load (Including Trailer) 920,400 Lbs / 884,400 Lbs

OUTAGE

- Start Date April 1, 1995
- Approximate Length 67 Days
- Construction Contractor Bechtel Power Corp.
- Normal Plant Complement 400
- Additional Replacement Personnel 450



Lampson



LTL 1200 Crane

Part 1: Background Information

This Lampson LTL 1200 Series 2A Crane was built by Neil F. Lampson Company in Keunewick near Richland, Washington. This 2600 ton crane can lift up to 1200 tons. The company makes 30 different translift style cranes that lift between 350 and 2000 tons. At Ginna, it will be lifting 350 tons at a time for each steam generator plus rigging.

The Neil F. Lampson Company has built cranes for other countries besides the United States. If a country needs to use one of their cranes, the company sells the crane to that country instead of taking it overseas, and then having to ship it back to the United States, which costs ~~a~~ lot of money.



Part 2: Visual Information

Lampson Crane:

• Assembly time	4 weeks
• Trucks to transport	120
• Weight of Crane	2600 Tons
• Counterweight	1500 Tons
• Boom Length	310 ft
• Mast Length	190 ft
• Max. Lift Height (Facade 117 ft)	185 ft
• Stinger Length	120 ft
• Max. Lift Capacity	1200 Tons
• Cable Length	6 Miles
• Crane Base Size	36 ft x 160 ft
• Max. Ground Speed	1/2 MPH
• Number of Operators	4
• VALUE	\$10,000,000

Containment Openings:

• Steam Generator A	Hexagon
• Steam Generator B	Hexagon w/slot
• Max. Diameter	22 ft
• Slot Width	9 ft 6 in
• Slot Length	25 ft 9 in
• Dome Construction	30 in Reinforced Concrete - 3 Layers of 2 1/4 in Steel Bar - 3/8 in Thick Steel Liner Plate

Steam Generator Lift Information:

• Test Lift	445 Tons
• S/G Lift (Includes Rigging)	350 Tons
• S/G Lift Radius	250 ft
• Time for Lift	12 Hrs
• Average Hook Speed	2 ft per min
• Ground Loading	12,900 lbs per sq ft
• Foundations (Reinforced Concrete)	
- Front	48 ft x 52 ft x 3 ft 9 in
- Rear	50 ft x 80 ft x 3 ft



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STEAM GENERATORS

IN A PRESSURIZED WATER REACTOR, WATER IS HEATED BY THE NUCLEAR FUEL. IT IS KEPT UNDER PRESSURE SO THAT IT WILL NOT BOIL. . . THE WATER IS PIPED FROM THE PRESSURE VESSEL TO A STEAM GENERATOR. THERE IT TRANSFERS ITS HEAT TO A SECOND SUPPLY OF WATER, WHICH BOILS TO MAKE STEAM FOR THE TURBINE. THE STEAM SPINS THE TURBINE WHICH THEN DRIVES AN ELECTRIC GENERATOR. THE END PRODUCT IS ELECTRICITY.



THE FUNCTION OF THE STEAM GENERATORS IS TO PRODUCE DRY SATURATED STEAM. THAT IS STEAM WITH NO MOISTURE CONTENT. IT DIRECTS THE STEAM TO THE STEAM DRIVEN COMPONENTS AND SUPPORT SYSTEMS. MOST OF THE STEAM IS USED BY THE MAIN TURBINE.

THE STEAM GENERATORS ARE CONSTRUCTED OF CARBON STEEL. THEY EACH WEIGH 300 TONS. THE MAIN COMPONENTS OF THE STEAM GENERATOR INCLUDES THE FEED RING (A WATER INLET); A BLOWDOWN CONNECTION (THIS REGULATES CHEMISTRY OF THE SECONDARY SIDE WATER); TUBE BUNDLE WRAPPER (ENCLOSES THE TUBE BUNDLE OF 3,260 TUBES. THIS NUMBER OF TUBES IS INCREASED IN THE NEW STEAM GENERATORS AT GINNA TO 4765 TUBES. IT DIRECTS THE FEED WATER TO THE BOTTOM OF THE TUBES); MOISTURE SEPERATORS (THEY REMOVE MOISTURE FROM THE STEAM); STEAM FLOW VENTURIS (THEY REGULATE AND LIMIT THE AMOUNT OF STEAM FLOW IN A STEAM LINE BREAK).

R.E. GINNA STATION STEAM GENERATORS
REPLACEMENT PROJECT

THE R.E. GINNA STATION POWER PLANT IS LOCATED IN ONTARIO, NEW YORK. THIS YEAR IT IS REPLACING ITS TWO STEAM GENERATORS. IN 1992, ROCHESTER GAS & ELECTRIC ANNOUNCED THAT THEY WOULD REPLACE THE STEAM GENERATORS IN 1996.

IN RECENT YEARS, GINNA STATION HAS EXPERIENCED A DEGRADATION IN SOME OF THE 3,260 TUBES THAT MAKE UP EACH STEAM GENERATOR. ABOUT 30% HAVE REQUIRED REPAIR. THERE HAS ALSO BEEN A CHEMICAL BUILDUP IN SOME OF THE TUBES. THIS REDUCED THE HEAT TRANSFER CAPACITY IN THE TUBES. BOTH OF THESE CONDITIONS WOULD CONTINUE TO ERODE THE PLANT'S PERFORMANCE IF THE GENERATORS WERE NOT REPLACED.

THERE WERE MANY STUDIES ON OTHER SOLUTIONS. THEY FOUND THAT THE REPLACEMENT PROJECT WOULD BE THE LEAST EXPENSIVE FOR THE CUSTOMERS. IT WOULD ALSO GIVE THE PLANT THE HIGHEST ABILITY TO SUPPORT GENERATING OF ELECTRICITY. THE OTHER SOLUTIONS WOULD HAVE REQUIRED RG&E TO BUY ELECTRIC POWER FROM OTHER SOURCES AT A HIGH COST.



THE NEW STEAM GENERATORS WILL REDUCE MAINTENANCE COSTS AND IMPROVE GINNA'S EFFICIENCY.

THERE WILL NO LONGER BE A NEED FOR AN ANNUAL SHUTDOWN FOR REPAIRS. THIS WILL BE EXTENDED TO AN 18 MONTH CYCLE.

BECHTEL POWER CORPORATION DID THE DESIGN AND ENGINEERING WORK. IT WILL ALSO OVERSEE THE CONSTRUCTION ACTIVITIES. BABCOCK AND WILCOX OF CAMBRIDGE, ONTARIO, CANADA BUILT THE NEW STEAM GENERATORS.

THERE HAS BEEN MANY HOURS OF TRAINING FOR THE REPLACEMENT PROJECT. A CONCRETE STORAGE BUILDING WAS BUILT FOR STORING THE OLD STEAM GENERATOR PARTS. THERE HAVE ALSO BEEN MANY BUILDINGS ERECTED AT GINNA FOR A WAREHOUSE, FABRICATION SHOP AND OUTAGE SUPPORT STAFF.

THE OLD STEAM GENERATORS WILL BE REMOVED BY CUTTING TWO HOLES THROUGH THE STEEL-REINFORCED CONCRETE DOME AND AN INTERIOR STEEL LINER PLATE. THERE IS NO RADIOLOGICAL HAZARD TO THE PUBLIC.

THE REPLACEMENT OF THE STEAM GENERATORS WILL BE ACCOMPLISHED BY USE OF A LARGE CRANE. THE CRANE ARRIVED AT GINNA IN 100 TRUCKS. IT IS ONE



OF THE WORLD'S LARGEST CRANES. IT HAS A BOOM OF 310 FEET, A 190 FOOT MAST AND A 120 FOOT STINGER. IT TOOK FOUR WEEKS TO ASSEMBLE AND LOAD TEST THE CRANE. ONCE THE REPLACEMENT PROCESS BEGINS, THREE CRANE OPERATORS WILL LOWER THE CRANE HOOK INTO CONTAINMENT AND REMOVE THE OLD STEAM GENERATORS. THE PROCESS WILL BE REVERSED TO INSTALL THE NEW STEAM GENERATORS.

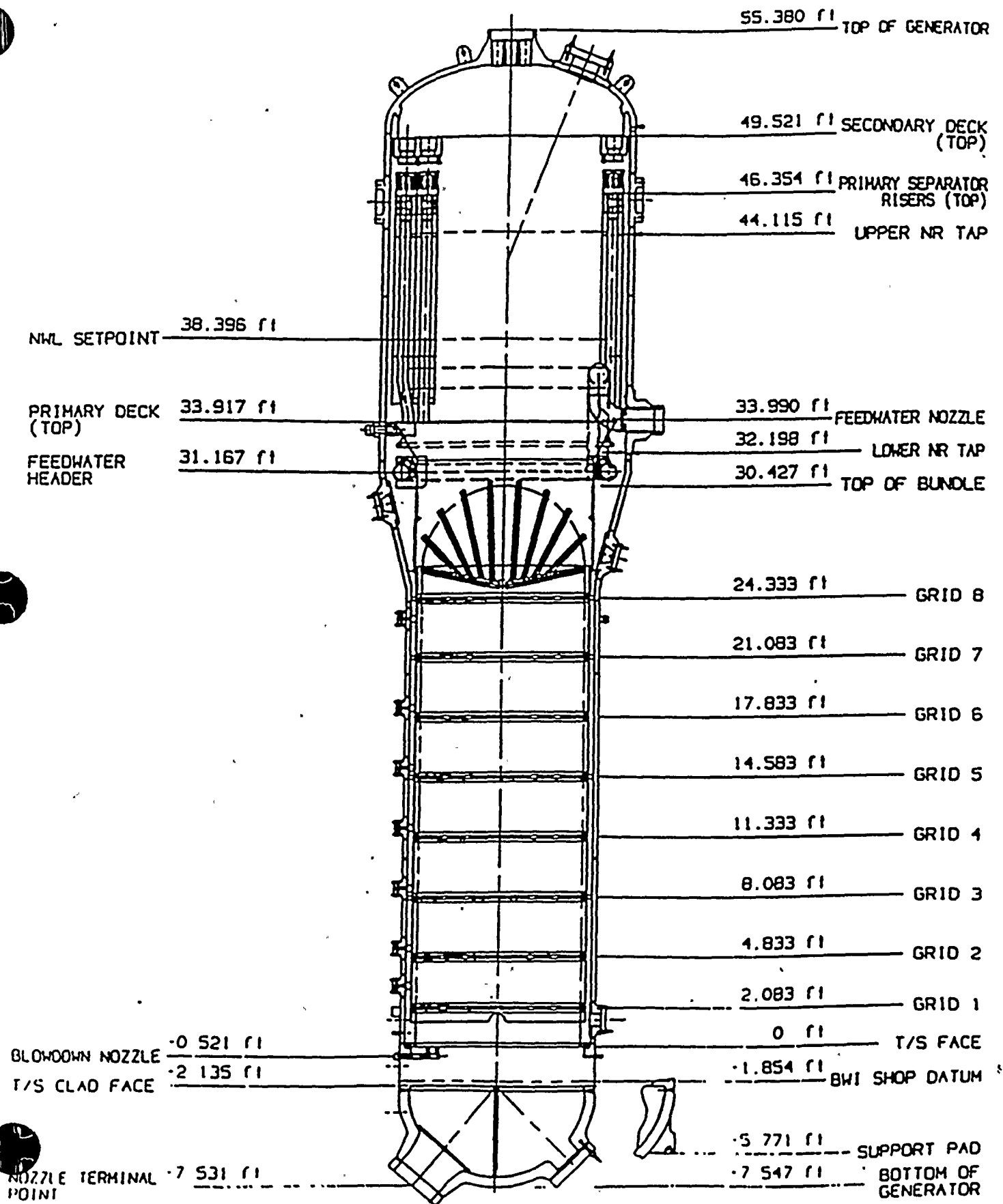


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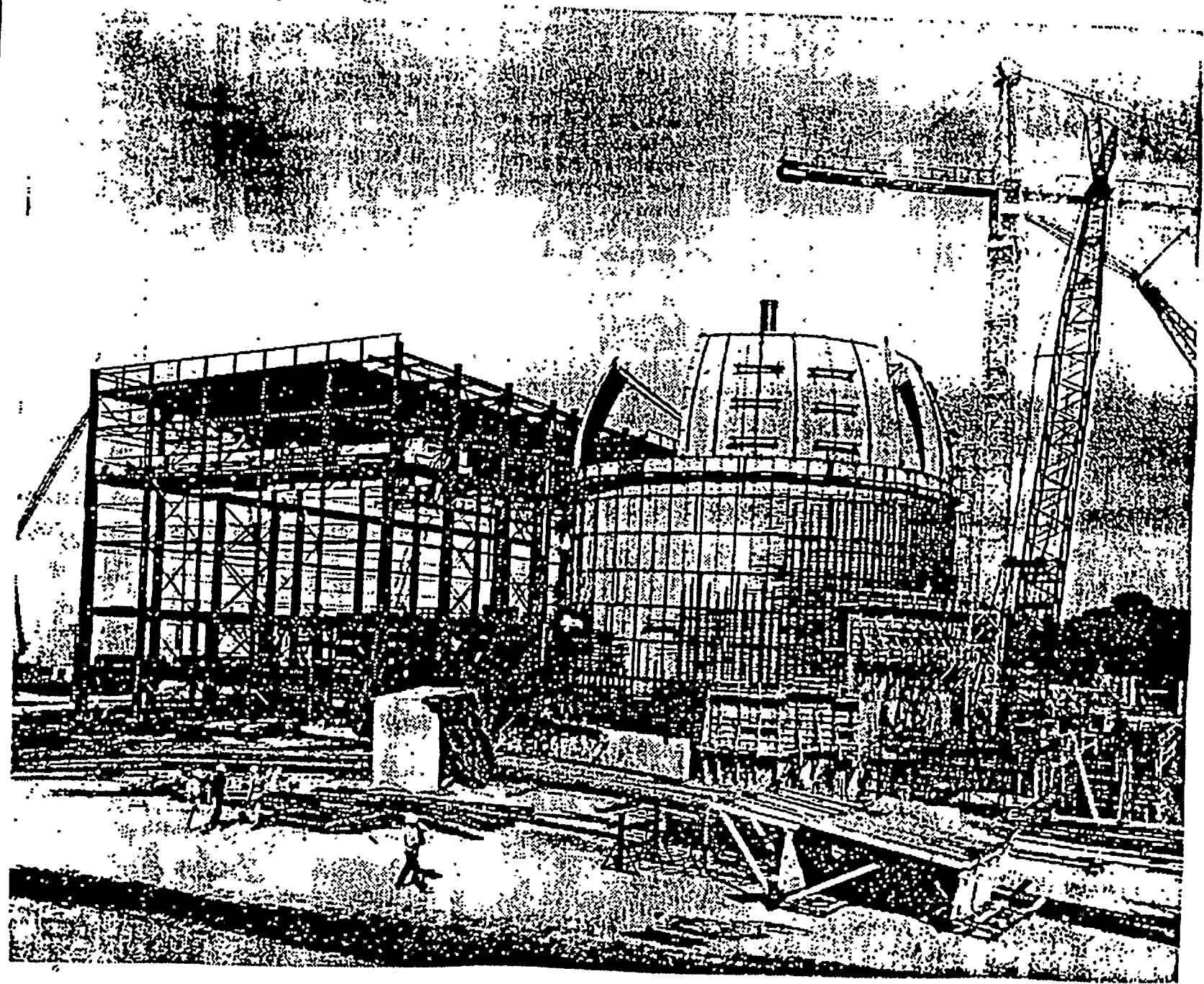
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Elevations of Interest









What's New In Electricity?

RG&E's New Nuclear Plant

It's not in operation yet, but you can see it being built. There is a perfect view of the construction from the Brookwood Science Information Center observation platform.

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Take a leisurely trip with your family east on Lake Road through 16 miles of beautiful scenery. Or drive east on Rt. 104 to Ontario Center Road and turn north to the Lake Road. Signs show the way.



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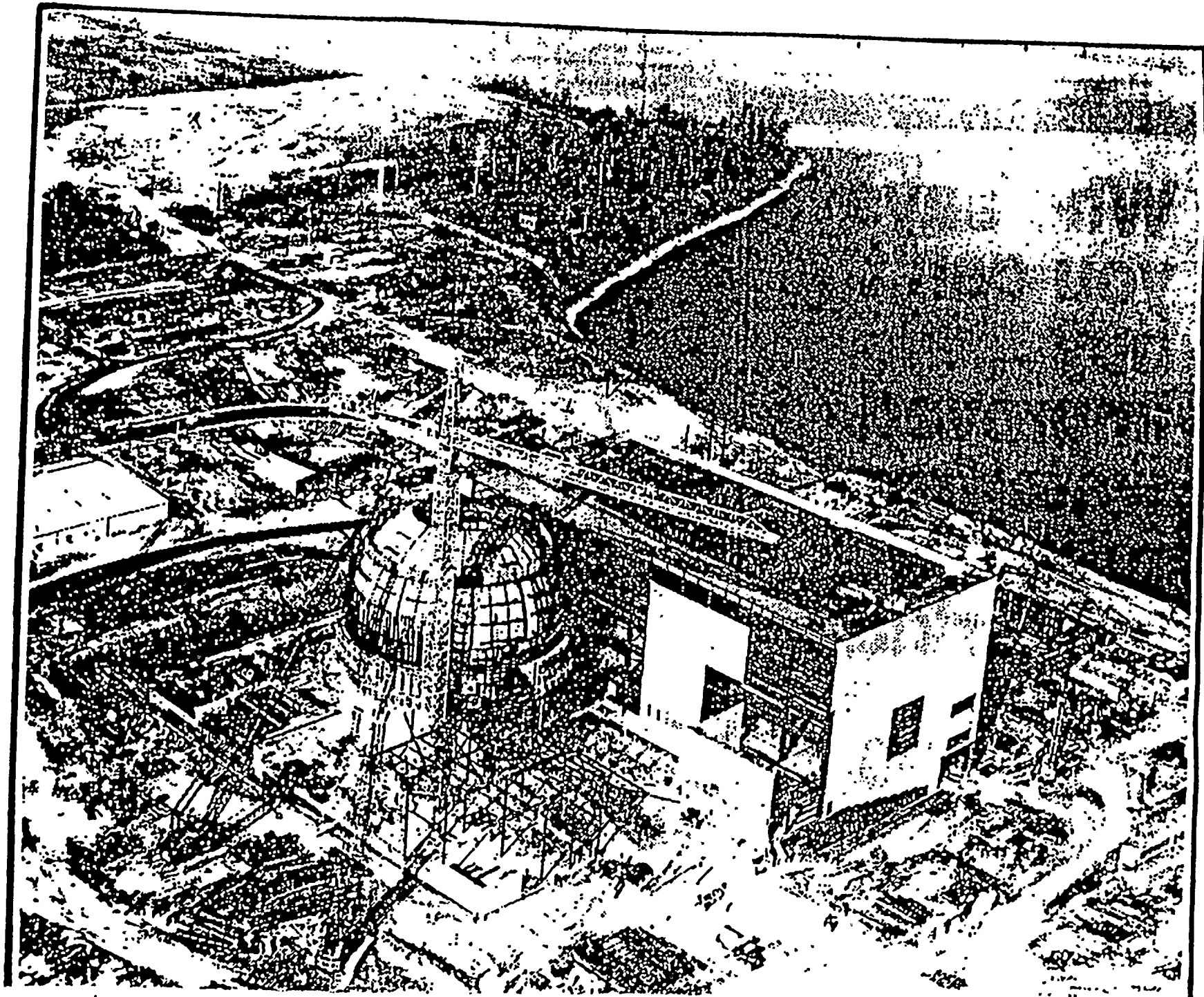


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AN INVESTOR-OWNED COMPANY WITH MORE THAN 26,000 SHAREHOLDERS

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POWER FOR PROGRESS

It's obvious—the Rochester area is growing by leaps and bounds. Look around you wherever you are—you'll see new homes, new highways, new apartment houses, new office buildings, new restaurants, new industrial plants. We at the Rochester Gas and Electric are proud to serve and to be a part of this dynamic community of people on the grow.

And that's why the RG&E is building the Robert Emmett Ginna Nuclear Power Plant. Electricity is an essential element in each of these projects. The electricity generated at the Ginna Plant will provide some of the thousands of kilowatts that our growing communities demand.

Nuclear power is the most up-to-date method for the generation of electricity and, as such, fits in with the modern and progressive Rochester community.

You are invited to visit Brookwood

RG&E's Science Information Center, located right at the plant site, was designed to show you how nuclear power works for you. There are exhibits, animated displays, slide shows, and films available for your enjoyment. Admission is free, and you are invited to visit the center any Wednesday through Sunday from 10 A.M. until 4 P.M. Just drive east on Ridge Road East, through Webster to the Ontario Center Road, where you turn left. Or drive north on the Seabreeze Expressway to the Lake Road and east for about 13 miles. Watch for the Brookwood sign to your left.



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AN INVESTOR-OWNED COMPANY WITH MORE THAN 25,000 SHAREHOLDERS

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Job completed flawlessly

Old Out, New In

The hardest part is done. The old steam generators have been lifted out, the two new steam generators are in and all that remains for this part of the plant's outage is reconnecting equipment and integrity testing of the reconstructed dome and welds. The Ginna Power Plant will be back in business and running better than ever come June.

If you attended any of the lifts and watched from the public viewing area off Lake Road, you could not help but be awed by the size of the Lampson crane and steam generators looming over the horizon. What you couldn't see from the viewing area was the amount of work going on to move those 316-ton steam generators.

Inside the Containment Access Facility (CAF), the staging area for people involved in the lift, employees worked on a number of aspects of the Steam Generator Replacement Project (SGRP).

For example, the day of the final lift was very windy and all sorts of precautions needed to be taken before the lift could take place. Weather information was continually checked from several different sources, including the National Weather Service, WOKR Channel 13's special weather service to

clients, and on-site monitoring systems.

Lampson crane driver Allen Watts was involved in every

detail, as he would make the final decision.

Although the winds were

blowing at 20 to 25 miles-per-hour, the

job could be done up to 35 mph. In addition, the wind was blowing directly into the crane, rather than from the side, lessening its effect.

Also in the CAF was a panel of video monitors showing several different views of the containment dome and crane. Two monitors were outside containment, looking in; two others were on the bridge crane looking down onto the steam generators, and four were underneath the steam generators.



Roger Kohler, RG&E President and CEO, congratulates SGRP manager John Smith after the final steam generator lift.



looking up. These were provided to view the steam generators from outside containment.

As the lift began, other employees manned their stations to monitor the lift. Among others, a crew was stationed with surveying equipment trained on the crane to check the movement. They took readings from various points on the crane to check for the height, angle and any tipping.

Robert Smith, Senior Vice President of Energy Operations, said that the people working on the SGRP are what made it work. "I believe the level of planning as well as the quality of the crafts-people paid off. It is very rewarding to have the lifts



The new "A" Steam Generator begins to enter the containment dome.

Representatives from Mitsubishi Heavy Industries, Babcock and Wilcox, and Shokuku Electric from Japan were just a few. Shokuku's Akata Nuclear Plant is planning on replacing their steam generators

completed safely and on schedule."

There were also several spectators on hand from corporations around the globe who were interested in the project. Representatives from

Ginna.

Another power company preparing for steam generator replacement is Arizona Public Utility Company, the largest power company in the United States. Rich Badsgard, the Senior Engineer of the replacement project at the Palo Verde Nuclear Generator Station, has also been on hand to witness the Ginna project.

His company owns three nuclear power stations outside of Phoenix, Arizona, and plans to replace the steam generators in one of them in 2002. The SGRP at Ginna allows him to view the process and estimate the time and procedures needed for a successful replacement. Even though they are not removing their steam generators through the roof like Ginna, our project still holds important information for him.

Despite delays from inclement weather, the Ginna project has been a complete success, from the construction of the steam generators right down to the operation of the crane. Everything is right on schedule.

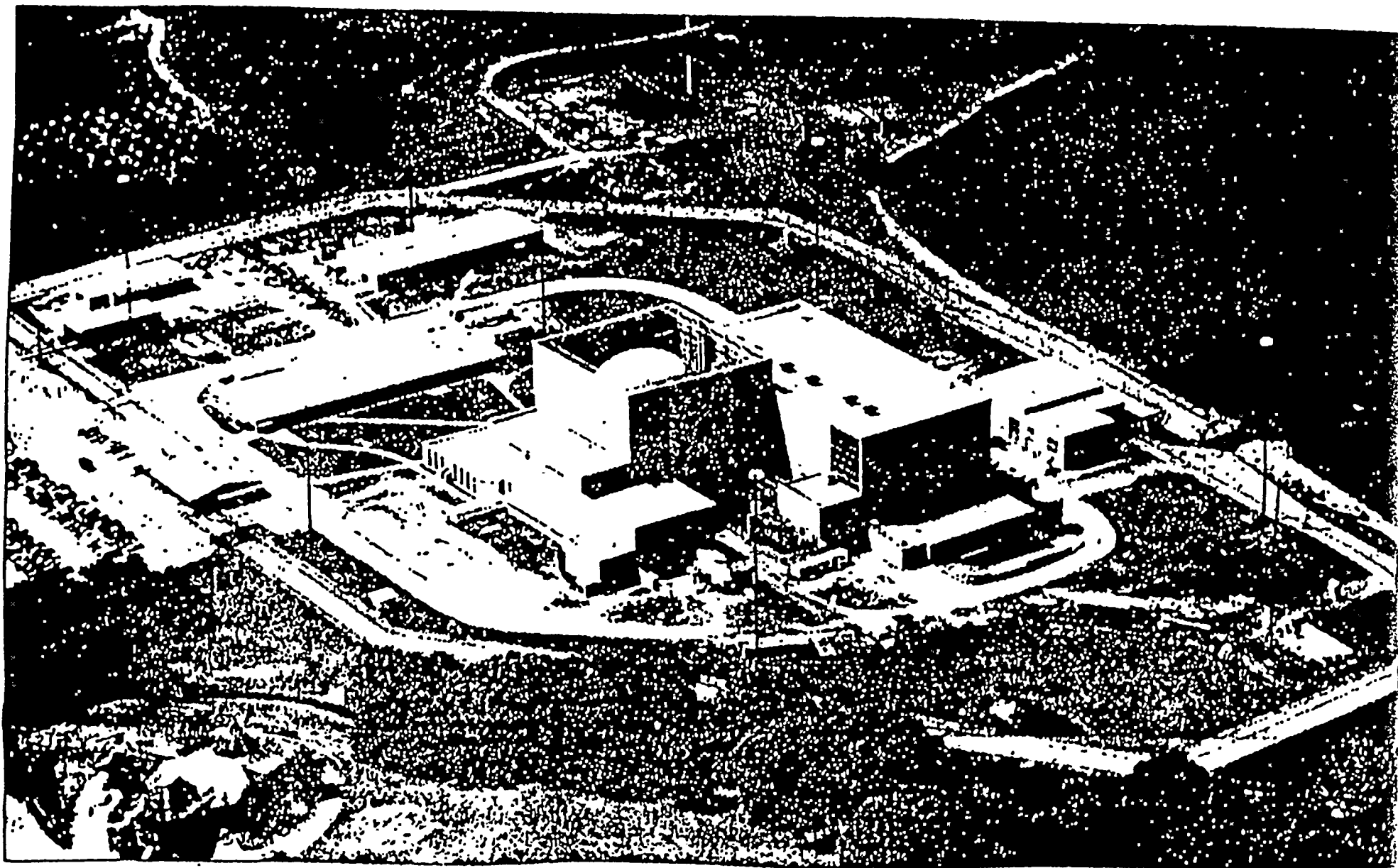
The pipe welds will be tested with non-destructive methods, using x-rays and imaging systems. The containment dome will also be tested by pressurizing containment to recommended levels and checking for leaks around the steel liner plate where the access holes were cut.

We estimate that plant start-up will take place on schedule in early 2002.

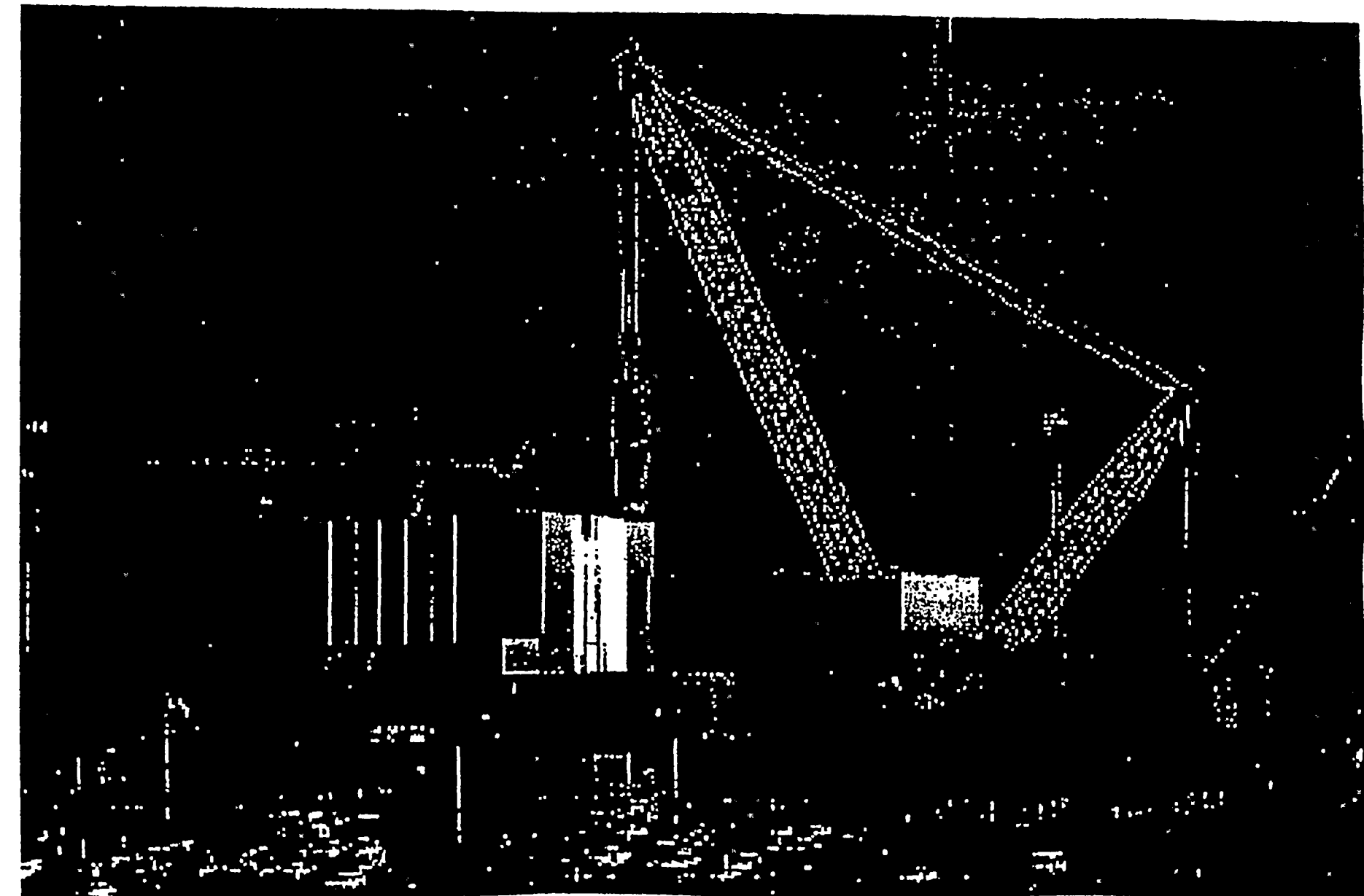


Lampson crane driver Allen Watts directs the "A" Steam Generator into position.











May 3, 1979

Ginna Leakage a Problem

Corrosion blamed at RG&E nuclear power plant, 14 others

The R. E. Ginna nuclear power plant 16 miles east of Rochester has been shut down five times since 1975 because of radioactive water leaking into the steam generator system.

The Ginna plant, run by Rochester Gas and Electric Corp., is one of 15 nuclear plants across the country suffering from corrosion problems that cause pipes to crack and leak small amounts of radioactive water.

George Lappan, spokesman for RG&E, said January 1978, was the last time Ginna has shut down for that reason.

Since then, RG&E engineers think they've solved the problem with a filtration system that removes the corrosive chemicals from the water.

"We think we have the problem defeated," he said.

The actual releases of radiation through the steam generator — and into the atmosphere — were very small, he said.

"We're looking at very low level of radiation — and any problems we've had with releases were well within the levels set by the Nuclear Regulatory Commission (NRC) "

Lappan said the releases were "fractions of a millirem." A typical chest X-ray is about 40 millirems, he said.

Staff members of the NRC told commission members yesterday the problem has caused extensive pipe damage in steam generators of five nuclear plants and "minor" to "moderate" damage to pipes at 10 other plants, including Ginna.

Lappan said the problem comes in the heat transfer system.

The highly pressurized, extremely hot "dirty" (radioactive) water from inside the reactor is piped from the reactor into two steam generators which have a total of 6,520 small pipes, each with a diameter of $\frac{3}{8}$ of an inch.

As those pipes pass through the steam generator system, they re-submerged in "clean" (non-radioactive) water.

The heat from the pipes is transferred into the clean water, which turns into steam and moves on to the steam generator to make electricity.

The problem comes when one of the pipes carrying the "dirty" water corrodes and radioactive water leaks into the "clean" water.

When that happens, the RG&E instruments pick up the leak, Lappan said. If the leak approaches the limit — a tenth of a gallon per minute — the plant is

shut down while engineers search for the leaking pipe.

Sometimes, engineers have to probe hundreds of pipes before they find the problem pipe, Lappan said.

When they find it, they plug it, Lappan said.

Since 1975, the plant approached the limit five times, and each time, the plant was shut down until the pipe was located and plugged, Lappan said.

The five times the plant was shut down for that reason are March 1975, January and April of 1976 and July and January of 1978. The average down time was 10 days.

In addition, more pipes have been plugged during regular maintenance shutdowns — when engineers check pipes for corrosion. If the pipe wall is more than 40 percent corroded, then it's plugged, Lappan said.

As a result, about 2 percent of the 6,520 pipes have been plugged, Lappan said.

The corrosion happens from the outside in, Lappan said, meaning the corrosive chemicals come from the "clean" water. RG&E engineers installed the filtering system after the last shut-down, and there have been no more problems, Lappan said.

The pipes, he said, are made of an alloy called inconel, which is 70 percent nickel, 20 percent chrome and 10 percent iron.

Darrell Eisenhut, deputy director of the NRC's division of operating reactors, said a chemical reaction involving acids, chlorine and salt causes the corrosive buildup between the pipes and their metal fittings, creating pressure — which leads to the leak.

He said the only solution now appears to be replacing the pipes. Scientists have been unable to develop a chemical to dissolve the corrosion buildup, he added.

November 11, 1979

How a reactor works

The Ginna nuclear power plant in the town of Ontario, Wayne County, is one of 43 pressurized water reactors in the United States used to generate electricity.

The proposed Sterling nuclear power plant, which RG&E and three other utilities want to build in Cayuga County, would use the same type of system.

In a pressurized water reactor, radioactive fuel in the reactor vessel creates heat.

The heat is caused by the splitting of atoms, called fission. It's carried away by water averaging 500 to 600 degrees.

A pressurization chamber prevents the water, contaminated with bits of radioactive "crud," from turning to steam.

The water prevents the fuel from overheating. Last spring's accident at

the Three Mile Island plant occurred after the water level inside the reactor fell dangerously low.

The superheated, radioactive water is pumped into a system of "heat exchange" pipes. These pipes run through a reservoir of clean water, heating it and creating steam — sort of a "tea kettle" effect.

This clean steam is let cut through a turbine to generate electricity. The steam is condensed and the clean water is recirculated.

The reactor vessel and some internal parts of it — the pipes carrying heated, radioactive water to the heat exchanger; the pressurization chamber; and parts of the cylindrical building that houses the reactor, called the containment building — would be removed if the plant were dismantled.

DECEMBER 4, 1979

Leak Shuts Ginna; Called No Hazard

But Cost Set at \$230,000 a Day

The Ginna nuclear power plant was shut down Sunday after technicians at the Rochester Gas and Electric Corp. facility detected "a very slight leakage" in a steam generator tube.

Richard Peck, an RG&E spokesman, said today that the condition does not pose any hazard to either plant personnel or the public. Scott Abraham, public affairs officer at the Nuclear Regulatory Commission's regional office in King of Prussia, Pa., said "there is no release of radioactive material at all."

Ginna is expected to remain closed for as long as 10 days to two weeks while repairs are being made, Peck said.

For every day the plant is shut down, RG&E will pay an additional \$230,000 to buy more expensive fuel from other sources, Peck said.

RG&E has not computed what the average customer may wind up paying for the

shutdown, but Peck said the additional cost will not be reflected on bills until two months from now.

The plant is located along Lake Ontario, 16 miles northeast of Rochester in the Wayne County town of Ontario.

Ginna technicians detected the "very slight transfer of fluid from the primary system to the secondary system which supplies steam to the turbine" during routine monitoring, Peck said.

"What they discovered was very tiny pinhole leaks in the steam generator," said the NRC's Abraham. "It's not at all unusual at these plants. In this case, the leakage amounts to one ounce of water a minute, which is very, very slight."

Similar shutdowns were ordered several times several years ago at Ginna, but the problem seemed to be alleviated when the company changed the chemical makeup of fluid in the reactor, Peck said.

DECEMBER 20, 1979

RG&E asks permission to use plutonium-239 fuel at Ginna

By MARK WERT

Rochester Gas & Electric Corp. says it plans to ask the Nuclear Regulatory Commission for permission to use some plutonium-laden fuel in a test at its Ginna nuclear power plant.

The test could focus attention on the questions of what to do with used nuclear power plant fuel and whether the federal government should allow the recycling of plutonium, formed as a byproduct of nuclear reactions at power plants and other nuclear wastes.

D RG&E spokesman Richard Peck said the utility and its customers would save about \$2 million if it's allowed to use the mixed oxide fuel.

Unlike the much more expensive uranium that's usually used to fuel reactors, plutonium is considered highly toxic if inhaled. One of the reasons President Carter cited when he stopped waste recycling in 1977 was that a small amount of plutonium could be made into a nuclear weapon.

Peck said Westinghouse Electric Corp. told RG&E three months ago the fuel would have to be moved by Dec. 31 from the Cheswick, Pa., facility where it was made.

The Nuclear Regulatory Commission gave RG&E permission to use the fuel at the Wayne County power plant on Feb. 12, 1975. But the utility temporarily

dropped the test after controversy arose over flying plutonium from England into New York City's Kennedy Airport. RG&E had planned to buy the plutonium from England.

Plutonium is virtually unknown in nature, most of it being produced in reactors.

The isotope that reactors produce as a waste, plutonium-239, isn't easily destroyed by nature. It has a half-life of 24,000 years.

An average reactor produces about 500 pounds of plutonium a year. Without reprocessing, it must be stored with other wastes.

"There's a tremendous resource available (in plutonium)," Peck said. "Our chairman (Francis Drake) says in our reactor — that's the safest place to store the plutonium. Nobody can steal it there."

Using plutonium as a reactor fuel isn't that exotic anymore, said Carl Goldstein, vice president of the Atomic Industrial Forum, the nuclear industry's trade organization.

After plutonium is recovered from spent fuel, it's converted to an oxide form and added to uranium oxide to make "mixed oxide" fuel.

NRC spokesman John Kopeck said mixed oxide fuel has been tested in other U.S. reactors.

Goldstein said the plutonium-laden

fuel is widely used in Europe. Great Britain and France have reprocessing industries and have reported no health or security problems, he said.

That was our (the United States) plan in the old fuel cycle," Goldstein said.

That changed when Carter became president.

He ordered an indefinite moratorium on reprocessing on April 7, 1977, citing the possible danger of nuclear weapon proliferation.

There also were questions about worker safety in reprocessing plants.

New York state is now negotiating for a federal takeover and cleanup of the nation's first commercial reprocessing plant at West Valley, Cattaraugus County.

Those in the industry blamed the plant's 1976 closing on government decision and regulation, while environmentalists said reprocessing waste wasn't economically feasible.

Peck said if RG&E's request is approved, the mixed oxide fuel would be placed in four of Ginna's 121 fuel assemblies.

A third of the assemblies are replaced during the plant's annual spring refueling, Peck said.

He said it was unlikely the NRC would approve RG&E's use of the oxide fuel before the 1980 refueling.



Electrifying deal

RG&E gets uranium through Soviets

When you flick on your lights today, think of the Soviet Union.

Thanks to a roundabout route, uranium enriched in the Soviet Union has wound up in Rochester Gas & Electric Corp.'s Ginna nuclear power plant in Wayne County.

Paul W. Briggs, chairman and chief executive officer of RG&E, said that uranium is now producing electricity.

It is the first time that uranium enriched in the Soviet Union was sold for use in an American nuclear power plant, the Commerce Department said yesterday.

And as an added brightener, it's saving you money — all told, about \$2 million.

How did RG&E get it?

Walt Wolf, president of Separative Work Unit Corp. of Gaithersburg, Md., arranged for the sale to RG&E. His firm fabricates fuel rods and is a broker for utilities.

Wolf said the uranium was mined in South Africa, then was sold by South Africa, enriched in the Soviet Union and sold to Austria. Newly mined uranium contains only 0.7 percent of uranium 235 — the kind that actually makes the reactor work. The ore has to be concentrated, or enriched, until the level reaches about 3 percent before it can be used.

Austria had to sell the enriched uranium after a referendum in November 1978 prevented use of nuclear power there.

RG&E bought 31,800 pounds of the fuel for \$12 million, about \$2 million less than the company would have paid from conventional U.S. sources, said George Lapparl, RG&E spokesman. The company emphasized that no money was given to the Soviets.

The savings will be reflected in fuel adjustment clauses on customers' bills, the company has said.

Once the transaction had been arranged through Wolf's firm, the uranium, which had been stored for two years in West Germany, was shipped to the Gaithersburg, Md. Wolf's company fabricated it into fuel rods. The completed rods were put in special containers and taken to Ginna by truck last year.

Wolf told the Associated Press that the U.S. government had to give assurances that the uranium would only be used for peaceful purposes.

In a telephone interview, Wolf said that to complete the deal, a letter was sent to the Austrians signed by Louis V. Nosenzo, then deputy assistant secretary of state for nuclear energy. Wolf said it gave the official assurance of the U.S. government that the uranium would not be used for weapons.

Such assurances are required under the non-proliferation treaty of 1978, which is aimed at halting the spread of nuclear weapons. The United States and the Soviet Union signed the treaty. And the Austrians were not allowed to ship the uranium without these assurances.

According to the Commerce Department, U.S. firms bought \$43.6 million of uranium from the Soviet Union in 1980. Val Zabijaka, an analyst of Soviet trade for the department, said he could not find a record of any previous purchases and that there had been none in the first four months of this year — the latest period on which he had information.

The other uranium imported into the United States was fabricated into fuel rods and sent to a West German utility, according to *The New York Times*.

Zabijaka added that Soviet plants for enriching uranium have outpaced the construction of power plants to use it in the Soviet Union, so Moscow is eager to have other countries buy its enrichment service.

Sue Pittman, a State Department press officer, said the department's only comment was that no government regulation prohibits the import of uranium enriched by the Soviets.

Only since 1978 have U.S. utilities been allowed to import uranium used in nuclear power plants.

RG&E's import license was approved in February 1980 by the Nuclear Regulatory Commission.

RG&E had an option to buy an additional 62,800 pounds, but decided not to exercise the option, Briggs said. Uranium prices have fallen in the meantime, and foreign uranium is no longer a bargain, he said.



Q/A:

The nuclear process

JANUARY 22, 1982

Q. How is the power produced in a nuclear reactor?

A. A process called fission is what makes a nuclear power plant run.

Fission is the splitting of a heavy atom into at least two smaller pieces. This splitting also creates two or three particles called neutrons.

The most important component in a nuclear power plant's fuel is an isotope of uranium called U-235 -- the heavy atoms that are split at Ginna.

This isotope of uranium makes up about 3 percent of the fuel in a reactor. The fuel is contained in ceramic pellets, the pellets are stacked in zirconium alloy tubes that are placed in a reactor.

When an atom of U-235 splits, it forms strontium (a metallic element), xenon (a chemically inactive gas) and three neutrons.

A tremendous amount of energy also is given off in the form of heat and gamma rays, a form of radiation.

And those additional neutrons go off and split other atoms, continuing a process that's called a chain reaction -- like a line of dominoes falling.

It's important to keep the nuclear reaction at Ginna going steadily to split atoms -- and eventually make electricity -- as efficiently as possible.

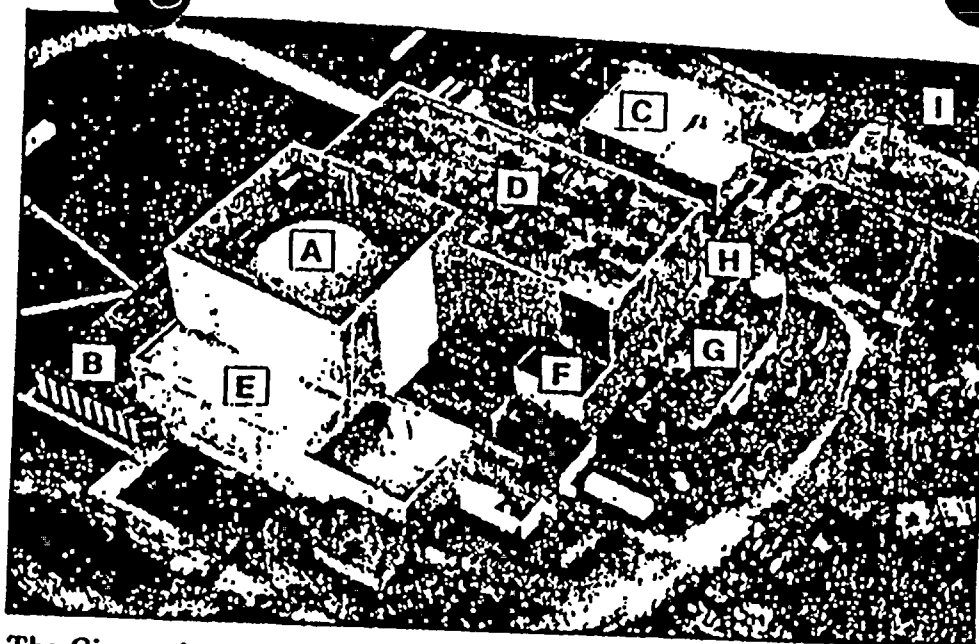
The goal is to have each fission create another fission. When the reaction inside a nuclear reactor reaches this point, it's said to have reached a critical mass.

Q. But how can that happen when splitting one U-235 atom creates three neutrons?

A. Some of the neutrons are simply moving too fast to split an atom, while others are absorbed into the reactor's walls.

The water in the reactor also slows the neutrons, helping to moderate the fission process.

Operators control the reactor by using electromagnets to insert rods made from cadmium and boron that are dropped between fuel cells.



The Ginna plant complex includes: (A) the containment building housing the nuclear reactor; (B) offices; (C) the water intake building and filtering room; (D) turbine building; (E) auxiliary building and spent fuel storage pool; (F) control room; (G) technical support center; (H) emergency generators; (I) Lake Ontario frontage.

The degree to which the cadmium/boron rods are inserted controls what's happening in the reactor because the boron in the rods is a neutron poison -- it literally eats the particles.

Q. But exactly how is electricity produced at Ginna?

A. The heat released when atoms are split in the Ginna reactor is carried away by water.

Water from this "primary system" is run through a series of pipes called heat exchangers. Steam that's formed in the exchangers (or "secondary system") runs a turbine, which is, in turn, connected to an electrical generator.

The steam is eventually condensed, using water from Lake Ontario.

About 33 percent of all the energy generated in a nuclear reactor actually ends up as electricity -- roughly the same efficiency as other forms of electrical generation.

Q. Does the water in the reactor serve

any other purpose than to carry away heat that's eventually used to create electricity?

A. Yes. It's also important to carry the heat away to keep the reactor's fuel cool.

Keep in mind the temperature of the water around the fuel is about 600 degrees. The fuel itself is very hot when the reactor is operating, averaging about 700 degrees on the outside of the zirconium alloy rods holding the uranium-enriched pellets.

Those zirconium rods will melt at about 1,800 degrees, causing a reaction that results in the formation of explosive hydrogen. And the control rods will melt at about 2,800 degrees.

The fuel also will remain quite hot after the nuclear reaction is stopped by inserting the reactor's control rods, so the water inside the reactor has to be kept circulating.

Given these facts, it's easy to see why reactor operators are told, above all else, to "keep it cool."



JANUARY 23, 1982



Robert E. Ginna, shown in a 1966 photo, influenced the building of a nuclear power plant in the Rochester area, down to the color of paint on the buildings — green in honor of his Irish ancestry.

Ginna named for ex-RG&E chairman

You've heard the name a lot — Ginna.

But the complete official title of Rochester Gas and Electric Corp.'s nuclear power plant is the Robert E. Ginna station.

It's named for Robert Ginna, who was RG&E's chairman of the board when the plant was planned and built.

Ginna, 79, of 12 San Rachel Drive, Pittsford, was an early and ardent supporter of nuclear power, one of the reasons why the utility made the deci-

sion to build the plant.

The plant was not only named in his honor but painted green — Ginna's favorite color because it reminded him of his Irish ancestry.

It also was Ginna's decision to retain the orchards on the site and build a facade hiding the reactor's containment building from public view. "The plant would look more like a modern school than a major industrial installation," according to a company history. *The RG&E Story.*

— MARK WERT



August 27, 1982

27 deficiencies at Ginna

A report on the nation's 11 oldest nuclear power plants says that Rochester Gas and Electric Corp.'s Ginna plant, located 16 miles north-east of Rochester in the Wayne County town of Ontario, failed to meet 27 current Nuclear Regulatory Commission licensing rules.

But the NRC's Advisory Committee on Reactor Safety, in a letter to NRC Chairman Nunzio Palladino, added that many of the deficiencies have been resolved.

RG&E spokesman Richard Peck said last night that Ginna, and the other older plants, were reviewed because they were built back before NRC regulations were as strict as they are today.

Seven of the problems are still being studied. Six involve the 12-year-old plant's structural design.

RG&E has agreed to fix all areas pinpointed by the study, he said, but he couldn't say how much that might cost.

Peck said the NRC wants RG&E to look at three things: a seismic detection system; flooding that could be caused by Deer Creek; and several

containment isolation valves that do not satisfy NRC's new requirements.

Updating the isolation valves will probably be the toughest job, Peck said. "I'm not sure what they didn't like about them, but I know it takes about two years to get new equipment like that designed and installed."

The valves work during an emergency to shut off contaminated water from the rest of the system, allowing clean water to circulate to cool the reactor.

That's just what happened during Ginna's Jan. 25 accident in which a tube ruptured, sending a plume of radioactive steam into the atmosphere, Peck said.

As for the seismic detection system, the NRC wants RG&E to drill holes measuring the surrounding groundwater 270 feet deep, instead of the current 250 feet, Peck said. "That should be done fairly quickly."

The possibility of Deer Creek flooding and causing problems at the plant simply wasn't considered when Ginna was built, he said.

RG&E will hire a consultant to do a flood control study of the creek, he said.

RG&E studies weak spot

Long-troubled steam generators may be replaced

By Steve Orr

Democrat and Chronicle

After fretting for two decades over the safety risk posed by chronically troubled steam generators at its Ginna plant, Rochester Gas and Electric Corp. may be on the verge of a solution.

Spawning ground of Ginna's worst accident 10 years ago tomorrow, the pair of generators would be cut to pieces and unceremoniously hauled away — replaced with shiny new models that would reduce the odds of another major accident.

But though improved safety is an objective and a likely outcome, the decision is being forced largely by dollars and cents.

"It's not a safety issue as much as it is an economic one," said Robert C. McCreedy, RG&E vice president for Ginna nuclear production.

The replacement project would cost about \$100 million, the company says, making it by far the most expensive undertaking ever at Ginna.

But the generator replacement is by no means a foregone conclusion. In fact, RG&E's initial economic analysis, which weighed a Ginna with new generators against other options, "showed the call to be very close," said Ron Liberty, an official of the state Public Service Commission.

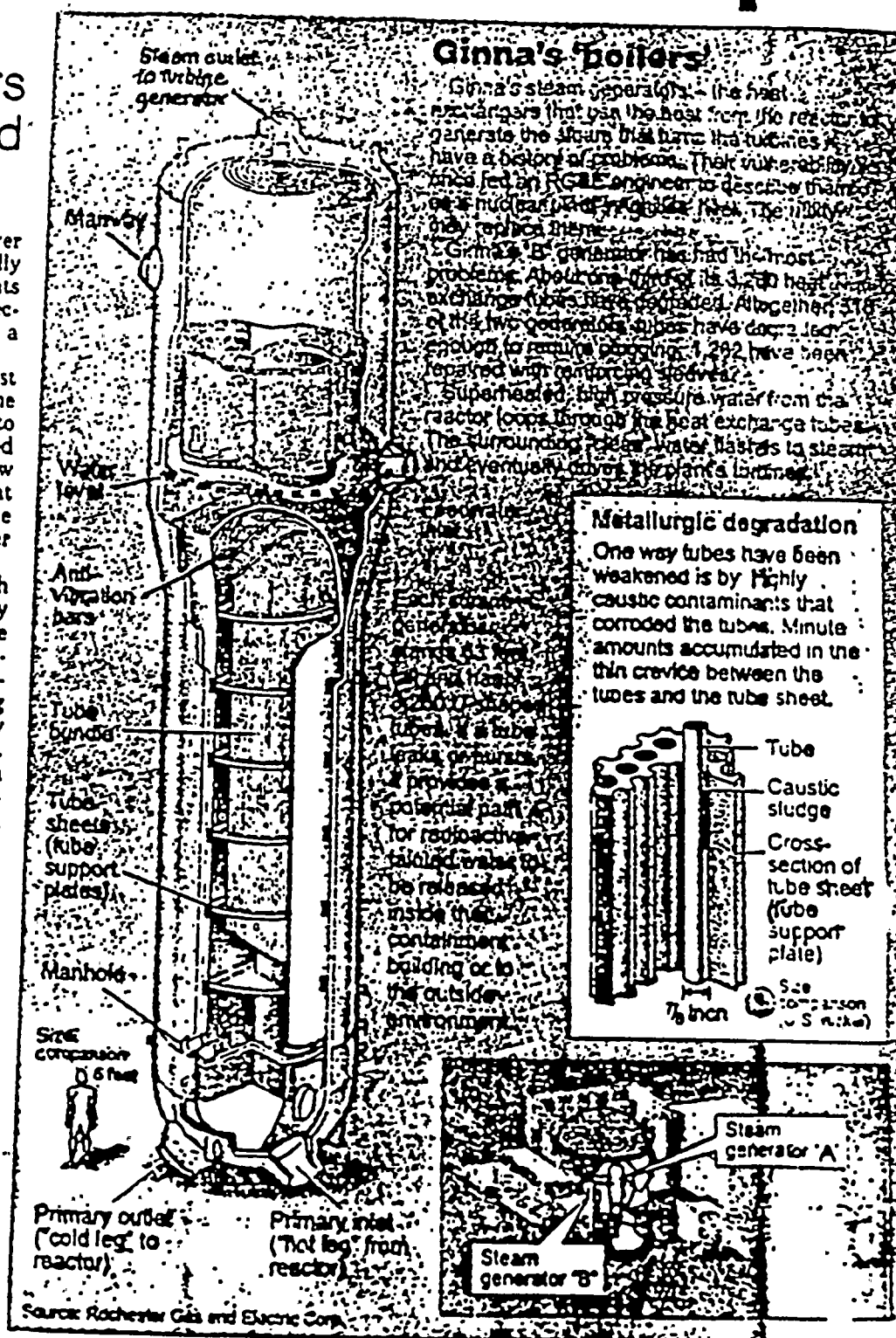
It is possible the new generators will not prove worth the expense. RG&E could opt to run Ginna as long as its old generators will hold up and then shutter the plant forever.

CRITICAL CHOICES



GINNA

AND ITS FUTURE
Second of three parts



RG&E to decide generators' future

"This decision is probably the most important that the company has made in many years and will make for many years to come," he said.

The company has received and is analyzing bids for two new generators from five manufacturers. New models would have to be ordered within the next several months.

But no decision has been made yet, RG&E Chairman Roger W. Kober said this week.

"It becomes a fairly big deal because there's a significant amount of money involved," Kober said. "But in the overall scheme of things, of generating power, it's not an awful lot of money."

Peter Bradford, chairman of the utility-regulating state PSC, said the decision will be RG&E's alone. But if the company seeks to raise rates to pay for new generators, its economic justification had better be in order.

"Our staff would be aggressively skeptical," Bradford promised.

RG&E must weigh cost, options

If RG&E does pursue replacement, Kober said, it would be done by 1995. The project would take the plant out of service for an estimated three months.

It also may involve cutting holes in the radiation-tight containment dome so workers can lower the new generators in — a tactic only one other U.S. utility has ever attempted.

Is it worth the cost and whatever risk accompanied the task? That's what RG&E must decide, comparing replacement to the costs of carrying on as before and the viability of alternatives.

RG&E has earned an industry-wide reputation for innovation and success in generator maintenance. Kober proudly noted, in fact, that RG&E is one of the few utilities that has managed through superior maintenance to keep its original generators in working order.

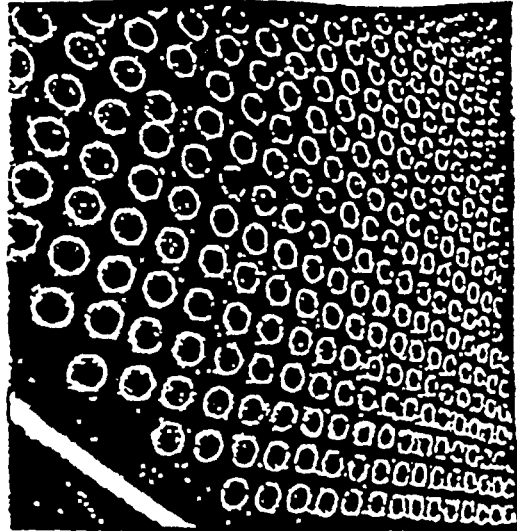
RG&E's expertise is born of experience: The first problem with a steam generator tube was detected at Ginna in March 1974, just 4½ years after testing began at a plant that was designed to last four full decades.

Manufacturer has faced lawsuits

Ginna is hardly alone in its woes. Many other utilities whose nuclear plants were built by Westinghouse Electric Corp., as Ginna was, have replaced steam generators. Five of the seven other plants with the same model generator as Ginna have done so already.

RG&E, however, has not pursued one course of action that a growing number of other utilities have — legal action against Westinghouse, which has been accused in highly charged lawsuits of concealing internal knowledge that its steam generator tubes were unreliable.

At least 16 utilities have filed or threatened to file lawsuits involving a total of at least 73



This cut-away view of a mechanical training area shows the pipe system that cools the nuclear plant's two steam generators.

steam generators. The plants at issue in those legal actions constitute 40 percent of all Westinghouse-built nuclear facilities in America.

Of the utilities that own the eight plants with identical generators, only RG&E and the New York Power Authority have not sued.

RG&E officials say they considered the matter and decided against suing. They also say they have not reached any out-of-court settlement with Westinghouse related to steam generator tube degradation.

"We've tried to evaluate whether there really is any merit to litigation. To date we haven't seen any," Kober said.

There's one wild card: the PSC, which may want to know why RG&E didn't seek damages from Westinghouse before asking consumers to pay the freight.

"Sure, that would certainly be a question our staff ... would look at," Bradford said.

Tubes examined, fixed yearly

Repairing degraded steam generator tubes has become a rite of spring at Ginna. Each March or April, when the plant is shut down for annual maintenance and refueling, hundreds of workers swarm over the complex, performing carefully orchestrated maneuvers.

The pair of 63-foot-high steam generators attract many of the workers, who use electronic probes to examine each of the 6,000 or so steam generator tubes that remain in service.

Last year, they looked for 10 different categories of degradation in the tube walls, which are just one-twentieth of an inch thick. They found evidence of five types of problems and identified 233 tubes that needed work.

In response, 210 were sleeved, a process by which a metal liner is inserted inside the degraded portion of the tube. An additional 23 were plugged and taken out of service.

As of today, 516 tubes, or 7.9 percent, have been plugged; 1,262 (19 percent) have been sleeved. Nearly three-quarters of the problems

are concentrated in the "B" steam generator. Ginna's first generator problems were caused by trace elements in water that flows around the tubes. Acting on Westinghouse advice in the early 1970s, RG&E added phosphates as a buffer.

In retrospect, that was a big mistake. That solved the initial problem but caused the one that's most severe today — weakening and cracking of the tube walls from buildup of phosphate sludge near the generator bottom.

Possible tube rupture a concern

The weak tubes create safety concerns.

The water flowing inside the tubes from the reactor is superheated and under great pressure, and a tube rupture can simultaneously cause a loss of coolant from around the reactor and a buildup of pressure. That can lead to venting of radioactive steam into the atmosphere and, worse, damage to the nuclear core.

The core was never uncovered or damaged in Ginna's 1982 accident, but radioactive steam did escape. It was by far the worst steam generator leak the plant has suffered — but not the only one. Between 1975 and 1979, five separate tube leaks forced unplanned shutdowns for repairs. There was another in 1988.

Cost of upkeep continues to rise

Over the years, RG&E has invested more and more time and money in keeping the old generators in working order. In the years 1983-85, for example, one company document filed with the PSC showed a budget of \$19.2 million for equipment related to generator repairs.

The time it takes for inspection and repairs is a factor as well; Mecredy said steam generator work adds 10 days to the plant's annual maintenance shutdown. That's 10 days when Ginna is not earning its keep, forcing RG&E to buy power elsewhere, usually at higher cost.

Overall, the cost of operating and maintaining Ginna has risen sharply in the last decade — from \$29.5 million in 1982 to \$80.6 million in 1990. Those figures do not include physical improvements, many related to Ginna's age.

In the years 1982-88, Ginna was an industry "leader" in such capital expenses, according to reports by Critical Mass Energy Project, a Washington-based nuclear research group.

RG&E spent nearly double the industry average if the size of the plants are taken into account, the group found.

During Ginna's lifetime, Liberty said, RG&E has invested \$334 million in the plant.

In the last few years, another expense related to the steam generators has arisen — a two-percent drop in power output. That represents power worth roughly \$5 million a year.

The problem is caused by fouling of the outside of the steam generator tubes, Mecredy said. Allen Johnson, who oversees Ginna matters for the NRC, said the power loss has been progressing at about 1 percent a year, though Mecredy said there are signs it is leveling off.

If enough tubes are plugged and sleeved, Mecredy said, that could lead to a further loss of power-generating capacity at the plant.

How long will generators last?

Company analysts weigh the future by com-

paring the cost of maintaining Ginna's old generators with the cost of installing new ones. And they weigh the cost of each against the cost of finding a new source for the 470 megawatts of power that now comes from Ginna.

The studies, company officials say, are based on Ginna's current license period — from now to 2009. They aren't examining the prospect of RG&E extending the federal license 20 years beyond that.

Liberty, deputy director of the PSC's power division, said he believes the old steam generators could be made to last until 2009.

"They can stumble along with the existing steam generators. But what happens is you have more leaks, more outages, more down time, until it finally doesn't make sense to keep the staff there and keep it operating any longer," Liberty said. "Whether that point is beyond the end of their license or is before it is really hard to tell. It's like, when's the next breakdown of your car going to be?"

If the generators are replaced, RG&E officials say, it is hoped they would last should the company go for a license extension. "We've always felt... that if we did want to extend the life of the plant another 20 years, we only wanted to replace the steam generators once," said Kober, who was vice president for electric production earlier in his career.

"But there's no question we're going to look at a life extension," he said.

Looking and doing are two different things, however. The U.S. Nuclear Regulatory Commission is just now issuing final regulations to govern license extensions.

Those rules are controversial. Responding to industry complaints of overly harsh regulation, the NRC is trying to streamline the process. Most environmental impacts, for instance, would be handled on a generic basis — done just once, for the entire industry.

The rules also would limit the age-related issues that could be raised when a plant applies for an extension.

RG&E officials say a final decision on relicensing — though they are studying the new rules and gathering information.

"Before we go into that process, we want a better handle on the procedure and the cost," Mecredy said.

Plant could become test case

Kober said it is "conceivable" Ginna would wind up as a test-case plant, one of the first to go through the relicensing process. The nuclear industry is seeking two bellwethers, one to represent each of the basic types of plants.

One seems set, but the other, a pressurized water reactor such as Ginna, is not. The Yankee Rowe plant in Massachusetts was going to do it, but has closed over safety concerns.

Mecredy said a Virginia plant played that role in an industry relicensing study — Ginna turned down the chance — and he assumes that plant might be the leading candidate.

Michael Marriott, of the Nuclear Information and Resource Service in Washington, D.C., said Ginna might be a candidate because of its good operating record. "Industry wants the kind of plant to go first that's going to be as least controversial as possible," he said.



JANUARY 24, 1992

How the NRC grades Ginna

The Nuclear Regulatory Commission conducts these overall assessments, called Systematic Assessments of Licensee Performance (SALPs) at each nuclear plant about every 18 months. The best score possible is 1 and the worst 3. That low rating triggers more intensive NRC oversight.

Plant function	1981-82	82-83	83-84	85-86	86-87	87-89	89-90
Plant operations	1	2	2	2	2	2	2
Radiological control	2	2	2	1	2	2	4
Maintenance and testing	1.5	2	1	1.5	1.5	2	2
Emergency preparedness	1	2	2	2	1	1	1
Security	1	1	1	1	1	2	2
Engineering and technical support	-	-	-	-	2	2	2
Safety assessment and quality verification	-	-	3	2	2	2	2
Other	1.3	1	1	1.3	1	-	-
Overall score	1.33	1.55	1.50	1.50	1.50	1.86	1.86

Note: The NRC changed the plant function categories several times over this period, combining some and doing away with others. All scores are reflected in this chart, though some are averages of two or three separate categories. The overall score shown here is the average of all scores given that period.

Source: Nuclear Regulatory Commission

Violations

During inspections or at other times, NRC officials may detect violations of agency regulations. Violations are ranked from the relatively minor 6, to the most significant 1.

Since 1981, RG&E was cited for three violations in class 3. All other violations were in classes 4, 5 or 6. RG&E was fined once in this time period.

SALP period	Total violations
1981-82	11
82-83	16
83-84	10
85-86	13
86-87	18
87-89	21
89-90	21

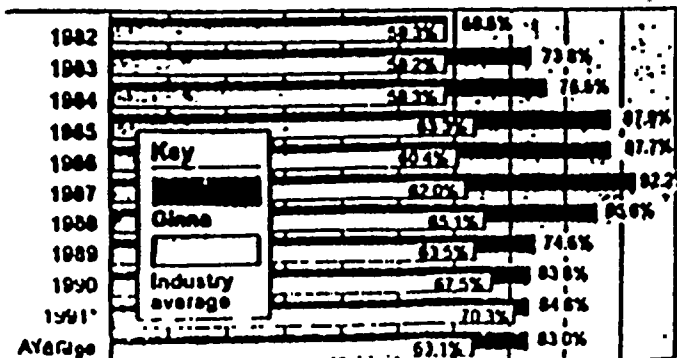
RG&E has fared far better in some areas than others. Emergency preparedness has consistently garnered the lowest violations, while safety assessment and quality verification have claimed the most.

Plant function	Average violations per SALP period
Safety assessment/quality verification	4.8
Engineering and technical support	4.3
Plant operations	3.8
Radiological controls	3.6
Maintenance/testing	3.4
Security	1.3
Emergency preparedness	0.3

Comparisons of Ginna's reliability and safety

One measure of Ginna's performance is its capacity factor. That capacity, expressed in percentage, is the proportion of time in a given year that a plant is in service. Plants with problems tend to operate less reliably.

Ginna's capacity factor vs. industry average



*Total time months of 1991

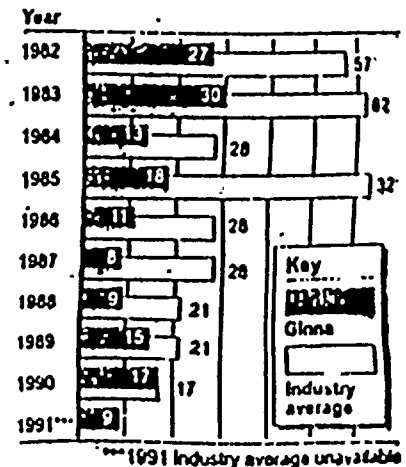
Ginna's lifetime capacity factor vs. various comparison groups

Ginna	76.1%
All other plants	68.1%
10 other oldest plants	63.8%
10 newest plants	66.7%
Other Westinghouse PWRs**	67.5%
Westinghouse PWRs** with same steam generators	68.5%
Other NYS plants	55.6%
Highest still operating Prairie Island 2, Minn., opened in 1974	84.6%
Lowest still operating Brooks Ferry 3, Ala., opened in 1977	32.5%

**Pressurized water reactor

Licensee Event Reports

Licensee Event Reports, or LERs, are incidents at power plants that must be reported to the U.S. Nuclear Regulatory Commission. They range from relatively minor problems to serious accidents. When comparing plants, one should know that utilities have some discretion over what they report.



**1991 industry average unavailable



Democrat and Chronicle

Resident praises 'wonderful neighbor'

She scoffs at fear,
says company has
treated family well

ONTARIO — Although Elizabeth Gates lives about a half-mile down Lake Road from the R.E. Ginna nuclear power plant, the most significant occurrence in January 1982 for her was not the accident that drew national media attention to the plant.

She was in Vermont, where her 39-year-old daughter, Roxanne, died from a brain tumor nine days before the Ginna accident.

"My son-in-law came home from teaching, he taught in Burlington, and he had a paper and the daily paper had a picture of Ginna and it was a picture of our barn and there we were in Vermont," the 79 year old Gates said during an interview at the kitchen table of her home.

"We weren't scared because nobody else seemed to be scared," she said.

Despite the 1982 accident, Gates says she has no hesitation about living so close to that facility and praises the way the company has treated her family.

"They have been just wonderful neighbors. I don't think there's a neighbor that would ever complain about them. They have been the kind of neighbors that anyone would be proud to have. And they've done everything to be helpful in every way," she said.

But friends who stop by to see Gates and the flowers that have gotten her into the newspaper in the past can't resist an occasional nervous joke about the imposing structure clearly visible from her yard.

"I feel safe because it's never bothered me. I have a large flower garden and so many people from all around, from Rochester and all the villages around, stop here in the summer time," she said.

"Of course, the flowers have always been pretty and everybody would say to me, 'I can't grow things like that,' and (visitors) would say,

PROFILE JANUARY 24, 1992

'Is it the (nuclear) plant?' and I'd say, 'That's probably where it gets the spirit to grow because it's just enlightened by that.'"

Gates met her late husband, Luther, through a classmate — his sister — while she was a student at college in Geneseo. They were married in 1937 and built their house in 1941.

Luther Gates, who was 78 when he died four years ago, was born in his parents' house next door and had worked on the family's 100-acre farm since he was a young boy.

"It was a family farm for as long as probably the land along here was ever developed from the Indians. I don't know if anyone else ever owned it," Gates said.

"As his dad grew older, then Luther took over the farm. ... About that time was when RG&E came out and bought the property."

Rochester Gas and Electric Corp., the operator of Ginna, now owns all but about 2 acres — where Gates lives — of the farm, and has the right of first refusal on the rest. It bought



Elizabeth Gates stands amid her locally renowned flowers in Ontario, Wayne County

the property, and other land near the plant, in accordance with Nuclear Regulatory Commission regulations that require an "exclusive zone" around the facility.

In the farm's heyday, the land was crisscrossed with apple and cherry orchards and fields of wheat, tomatoes and corn. Now RG&E rents out most of the property to farmers.

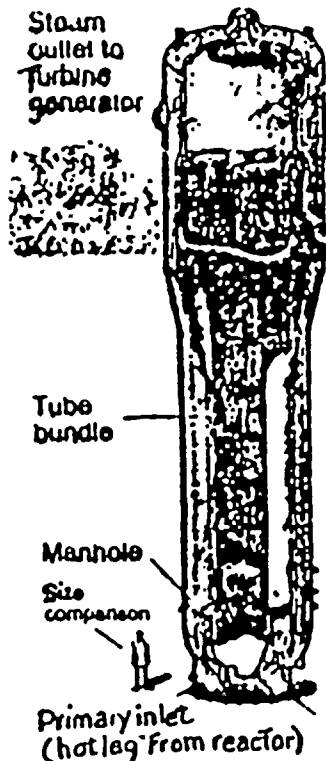


DECEMBER 17, 1995

Ginna to get new generators

Replacing the 'boilers'

Rochester Gas and Electric Corp. has announced a plan to replace the two steam generators at its Ginna nuclear power station. A huge crane will lift the old steam generators through holes cut in the concrete and steel dome of the containment building. The new steam generators will be lowered through the same holes.



The steam generators

Steam generators are heat exchangers that use the heat from the reactor to generate the steam that turns the turbines. Superheated, high pressure water from the reactor loops through the heat exchange tubes. The surrounding "clean" water flashes to steam.

The 13- by 63-foot steam generators have a history of problems. In one generator, about one-third the 3,260 heat exchange tubes have degraded.

Access holes cut in dome of the 100-foot-tall containment building

Steam generator

Nuclear reactor

250- to 300-foot boom

Building that houses the electricity-generating turbines

Crane's counter-balance system

Lake Ontario

The new steam generators will be brought in by barge to a port at the mouth of Bear Creek. From there they will be transported by truck the mile-and-a-half to the Ginna plant.

Outfitted with a 250-to 300-foot boom, the giant crane needed to remove and replace the two 350-ton generators will be transported in pieces and assembled on site.

The old steam generators will be stored in a specially built at the Ginna site.

DECEMBER 17, 1992

Longer life sought for Ginna

RG&E to replace aging steam generators in '96

Rochester Gas and Electric Corp. hopes to extend the life of its Ginna nuclear power plant through the first decade of the next century by moving now to replace the plant's aging steam generators.

The company announced yesterday afternoon it will spend \$115 million to replace the pair of generators at the Ontario, Wayne County, facility in 1996.

RG&E had previously announced it wanted to continue to operate the plant, one of the oldest nuclear installations in the country, until its federal operating license expired in 2009.

But some officials were not certain that Ginna's steam generators, plagued by tube degradation that is common in the industry, could remain economically viable until that time.

By replacing the generators, RG&E intends to erase any doubts about Ginna's ability to live out its planned useful life.

"I won't say this guarantees it, but it certainly enhances the plant's ability to do so," company President Roger Kober said.

The project, which will require the plant to be shut down for at least 90 days in the spring of 1996, is the largest single undertaking ever at Ginna.

But Kober said it likely will not cost consumers a great deal.

During the first three or four years after the generators are installed, customers should see electric rates rise by 2 percent or 3 percent, Kober said.

But offsetting that increase over the long run are improved efficiencies due to the new equipment. In fact, Kober said, replacing the steam generators will cost consumers \$30 million less over the plant's lifetime than continuing to operate Ginna with its relatively inefficient old generators.

"We don't see it as having a big impact on the customer," Kober said yesterday. "It's in the best interest of our customers to take this step."

About half the total electricity used by RG&E customers comes from the 22-year-old Ginna plant, which has 350 employees on-site and 150 more engineers and other support people.

Deteriorating steam generators have posed serious problems for a number of U.S. nuclear plants, including Ginna. About 10 other utilities have replaced steam generators at their facilities, including at least five of the seven other plants with the same model generator as Ginna.

The owner of a nuclear plant in Oregon announced recently it will close the facility rather than bear the cost of replacing steam generators.

Longer Ginna life sought

Many generators have been plagued with cracking or degradation of the thin heat-exchange tubes that form the core of the generators — the spot where heat from the reactor core produces steam to power turbines.

About 7.5 percent of Ginna's tubes have been taken out of service due to degradation. Cracked or degraded tubes still in use increase the chances of a significant accident, while a permanent drop in operating efficiency can result if too many tubes are taken out of service.

Another type of generator problem at Ginna already has decreased their efficiency, leading to a drop in power output of about 3 percent.

The worst accident in Ginna's history occurred in one of its steam generators when, in January 1982, a one-time error triggered a tube rupture. A small amount of radioactive steam released during the episode proved harmless, but underscored the vulnerability of the generators.

The decision to replace the generators was made formal yesterday by RG&E's board of directors. Company officials said they then announced the plans to employees and government regulators.

Analyst Paul Gioia, a former PSC chairman, said the decision likely will be good for customers and stockholders.

"It's hard to say without looking at their analysis," said Gioia, senior vice president at First Albany Corp. "But I think if the analysis was well done, it will be positive in the sense that it ends the uncertainty and provides a reliable source of power."

The project will be reviewed by the U.S. Nuclear Regulatory Commission but probably will not require a license amendment, said Robert E. Smith, senior vice president of production and engineering at RG&E.

Project approval is not required from the New York State Public Service Commission, but the company must have the PSC's permission in order to charge ratepayers for new generators.

The company also would need the PSC's approval to use long-term financing for the project. Kober said RG&E would finance part of the project through outside sources.

PSC Chairman Peter Bradford could not be reached for comment.

The \$115 million price tag includes \$40 million for the generators and \$60 million for installation, with the rest going for engineering and other costs.

RG&E will pay roughly \$21 million more to buy replacement electricity during the 90-day shutdown planned for the work.

Ginna now is shut down annually for about 45 days for refueling and maintenance, with as much as a quarter of that time attributable to inspection and repairs of its steam generators.

It was feared that as the steam generator tubes continued to degrade, the outages would last longer and longer, increasing operating costs.

With the new generators, each shutdown will be of shorter duration, Smith said.

Preparation for the generator replacement will begin at the next routine maintenance shutdown in March. The company will begin an NRC safety analysis of the project, although officials said the project will not be much more risky than routine maintenance.

The old generators, which will be classified as low-level radioactive waste, will be stored in a special building on the Ginna site.

RG&E will award bids for the generators by the end of the month. The generators will be built by either Westinghouse Electric Corp. or Babcock and Wilcox Canada.

Neither company can deliver the generators before late 1995 or 1996, Smith said. They'll be delivered by barge to the plant, which sits on Lake Ontario's shore. The project will provide about 500 short-term construction jobs for union workers.



Old-age checkup sought for Ginna nuclear plant

Feds name RG&E among 15 owners

April 3, 1993

Rochester Gas and Electric Corp. may have to conduct a new study to verify that the aging reactor vessel at its Ginna nuclear power plant is safe.

The U.S. Nuclear Regulatory Commission has asked the owners of 15 older nuclear plants, including RG&E, to perform the special analyses, commission spokesman Frank Ingram said yesterday.

The analyses were ordered after the commission concluded that the 15 plants' reactor vessels might fail a metal-toughness test.

Reactor vessels, made of hardened steel, encase the plants' radioactive cores where the nuclear reactions occur.

They are an integral part of nuclear plant safety, since one of the worst hypothetical nuclear accidents would involve failure of a reactor vessel — and a resulting loss of the reactor coolant.

RG&E spokesman Mike Power said the utility is still discussing the matter with federal regulators and has not begun the new analysis.

Power also stressed that RG&E believes Ginna's reactor vessel meets current federal standards.

"We're confident the vessel is safe," he said.

There always has been concern about the integrity of the vessels in older plants like Ginna, because the vessels tend to lose strength, becoming more brittle, as they are bombarded with radiation from the core.

Concerns about "embrittlement" were heightened in late 1991 when the owners of the Yankee Rowe nuclear plant in Massachusetts closed the facility because of commission concerns about vessel integrity.

Unwilling to make costly improvements to satisfy the commission, the utility closed the plant last year.

The commission's staff decided to reassess vessel integrity after the Massachusetts incident, "essentially, so we could avoid surprises like Yankee Rowe," Ingram said.

The current discussion centers around one specific test of the durability of the reactor vessels, known as a Charpy test.

The test is performed by dropping a weight onto a sample of the metal used to make the vessels, and measuring the metal sample's ability to withstand the impact.

Reactors are built with metal samples inside the vessel that are removed periodically and tested.

The commission safety standard is that the samples must be able to withstand a force of at least 50 foot-pounds.

RG&E, in its original analysis of three samples previously taken from the reactor vessel, measured the value as low as 50.0 foot-pounds. The average of the three was 51.8.

But commission staffers reanalyzed Charpy test data submitted by RG&E and the other utilities and came up with values below 50 foot-pounds, Ingram said.

He said the agency has asked utilities to use new methods to recalculate.

Coincidentally, RG&E workers removed a fourth metal sample from inside Ginna's reactor vessel on Monday. It was the first sample withdrawn in 13 years.

Power said testing of the metal will not be completed for at least six months. □

U.S. more watchful at Ginna nuclear plant

Maintenance issues lead to shutdowns

NOVEMBER 3, 1994

Federal regulators say they have increased scrutiny of maintenance at the Ginna nuclear power plant in Wayne County because of a series of equipment problems there.

The troubles caused three unscheduled shutdowns of the plant's nuclear reactor in the last year, said Thomas T. Martin, regional administrator for the U.S. Nuclear Regulatory Commission. Those reactor shutdowns in turn led to four unplanned service outages during which Ginna did not generate electricity.

Martin said NRC officials were surprised by the problems because Rochester Gas and Electric Corp., which owns and operates the Ginna plant, was judged superior at maintenance in the plant's most recent grading 13 months ago.

He said the agency, which oversees all nuclear reactors in the United States, has increased the intensity of inspections of maintenance activities at Ginna, in the town of Ontario.

"It's an extra measure of caution, if you will," Martin said yesterday in Rochester, where he held a briefing for reporters on NRC activity in New York state.

He said that overall, RG&E does a good job operating Ginna

RG&E spokesman Mike Power said the utility does not challenge the agency's view.

"We share their concerns. There have been an unusual number of reactor trips (shutdowns) compared to our previous 23 years of service," Power said. "We're looking into it closely."

Martin said NRC officials also are concerned because a series of staff reductions by RG&E could cut into the maintenance force at the plant and exacerbate problems in the future.

He said he did not believe the work force reductions had any impact on the earlier maintenance problems.

Company spokesman Power said the Ginna work force, at the plant and in support roles elsewhere, has been cut over the last year from 492 to 447 positions, a reduction of 9 percent. The overall company work force has been cut by 22 percent.

He said, however, that RG&E is confident that maintenance will not be hurt by the reductions.

Power also said the company thought that aging of the plant, not maintenance shortcomings, accounted for the service outages. Ginna, which went into commercial operation in 1970, is one of the oldest commercial nuclear plants in the nation.

But Martin said aging is not the underlying problem, and suggested the company may need to do more preventive maintenance to avoid problems with equipment that is wearing out. □

Ginna ready for annual shutdown

The annual shutdown of RG&E's Ginna nuclear power plant, which begins tomorrow night, will include preparation for next year's steam generator replacement.

Rochester Gas and Electric Corp. shuts down the Ginna plant in Ontario, Wayne County, each year for refueling and routine maintenance.

Maintenance work during the six-week outage will cost \$15 million and include replacement of a condenser and coolant pumps.

Preparation for the steam generator replacement will push the bill up higher. Workers will run surveys and do other jobs, such as preparing for the removal of piping and duct work.

Engineers from Bechtel Group Inc. will be at the plant during the outage. Bechtel, which will help coordinate the project, has had representatives at the plant since January and already has a staff of 35 on location.

Steam generators are giant heat exchangers. Superheated water from the nuclear reactor passes through a series of tubes, turning the surrounding water into steam. The steam turns the turbines that generate electricity.

Replacing the steam generators is a \$115 million job designed to allow the plant to work efficiently until its operating license expires in 2009.

Corrosion problems and leaking have plagued the original generators since the plant began operating 25 years ago. The problems have cut the electrical output at the plant to the point where RG&E was forced to choose between replacing the generators or closing down the plant.

RG&E decided to replace the steam generators in 1992 when a cost-benefit analysis showed it was cheaper to replace the generators and keep Ginna running than to shut down the plant and get electricity from other sources. About half the electricity produced by RG&E comes from Ginna.

Replacing the steam generators still is the best deal, even though the

company has lowered its operating expenses, and the cost of replacement electricity has dropped, said Robert C. Mecredy, vice president of Ginna nuclear production. It is in RG&E's best interest in the long term to keep the plant running efficiently, he said.

Steam generators have been replaced at other plants around the world. However, RG&E will use a largely untried method for completing the replacement — moving the steam generators through a hole cut in the plant's containment dome.

A huge crane will be used to lift the old generators through the hole and lower the new ones in. This summer, workers will build a platform for the crane, one of the largest in the world.

Both the old and new generators will be left intact throughout the operation. The new ones are 63 feet high, 14 feet in diameter at their widest point and weigh 315 tons.

The generators are being built by Babcock and Wilcox of Cambridge, Ontario, Canada. They'll come across Lake Ontario by barge and be unloaded at Bear Creek, a few miles from the plant. Dredging at the creek to accommodate the barge is slated for this year.

The old generators, which will be classified as low-level radioactive waste, will be stored in sealed concrete containers at the Ginna site. Since a national low-level radioactive waste dump in South Carolina banned waste from New York state last summer, the plant has been storing all its low-level waste on site in metal boxes or shielded containers.

This year's Ginna outage follows a November report from the federal Nuclear Regulatory Commission, which said the agency is heightening scrutiny of Ginna because of a series of equipment problems. Those problems resulted in three unscheduled shutdowns of the plant's nuclear reactor last year, the NRC said.

Mecredy said the company has addressed those problems. □



DECEMBER 17, 1995

Utility to cut dome open; no danger, officials say

Rochester Gas and Electric Corp. will use one of the world's largest cranes to haul out the steam generators at Ginna nuclear power plant and lower in a new pair.

The company will gain access to the building by cutting twin holes in the top of Ginna's containment dome.

"We'll be the first to do it that way," said Robert E. Smith, RG&E's senior vice president of production and engineering.

Each generator weighs 350 tons.

Smith and other RG&E officials said that despite the holes in the containment dome, the project should present no threat to public safety.

"From a radiation standpoint, it's really not a big event," Smith said.

The vast majority of the radioactive material — the nuclear fuel core — will be removed from the containment structure before work begins.

Any dust or other radioactive debris inside the structure should be contained there by fans that keep air flowing into the building, not out, Smith said.

He said the situation will be similar to Ginna's annual refueling and maintenance shut-downs, when large doors in the containment walls are left open to the outside air.

It is because those access doors are not quite big enough to accommodate the 63-foot-long, 13-foot-diameter steam generators that RG&E has decided to cut holes in the reinforced concrete containment building.

RG&E has not settled on a contractor for the project, but already is planning to use a huge

Lampson crane to lift out the old generators and lower in the new ones. The new carbon steel generators will be built in either Pensacola, Fla., or Cambridge, Ontario.

The crane, which will arrive at Ginna in dozens of tractor-trailer trucks for assembly on the plant grounds, will have a boom 250 to 300 feet high, Smith said. It will have to hoist the generators at least 175 feet into the air to get them above the dome.

Plans must be approved by the U.S. Nuclear Regulatory Commission. After the generators are installed, the dome's reinforcing steel will be welded back in place and new concrete added.

Smith said the dome, meant to protect key sections from outside stresses while containing any interior explosions, should be as strong when reconstructed as it was when first built.

Workers to try 1st-ever cut into dome

To replace Ginna's steam generators, Rochester Gas and Electric Corp. will use one of the world's largest cranes to haul out the old models and lower in the new pair.

The company will gain access to the building by cutting twin holes in the top of the Ginna plant's containment dome — something no other nuclear utility has attempted.

"We'll be the first to do it that way," said Robert E. Smith, RG&E's senior vice president of production and engineering.

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Smith said the dome, meant to protect key portions of the plant from outside stresses while containing the force of any interior explosions, should be as strong when reconstructed as it was when originally built. □



\$115 million project to save in long run: RG&E

Rochester Gas and Electric Corp. will spend \$115 million to replace the aging steam generators at its Ginna nuclear power plant in Ontario, Wayne County, the company announced yesterday.

Two new generators will be installed in 1996, allowing the plant to operate more efficiently through 2009, when its current federal operating license expires.

Although company officials said the project is the largest undertaken by RG&E since the construction of Ginna in the 1960s, President Roger W. Kober said consumers likely would not be hit hard by the expense.

During the first three or four years after the generators are installed, customers should see electric rates rise by a total of 2 percent or 3 percent, Kober said.

But offsetting that increase, over the long run, are improved efficiencies due to the new equipment. In fact, Kober said, replacing the steam generators will cost consumers \$30 million less over the plant's lifetime than continuing to operate Ginna with its relatively inefficient old generators.

"We don't see it as having a big impact on the customer," Kober said yesterday. "It's in the best interest of our customers to take this step."

About half the total electricity used by RG&E customers comes from the Ginna plant, which went into operation in 1969 and has 350 employees on site and another 150 engineers and other support people.

Deteriorating steam generators have posed serious problems for a number of U.S. nuclear plants, including Ginna.

About 10 other utilities have replaced steam generators at their facilities, including at least five of the seven other plants with the same model generator as Ginna.

Many generators have been plagued with cracking or degradation of the thin heat-exchange tubes that form the core of the generators — the spot where heat from the reactor core produces steam to power turbines.

About 7.5 percent of Ginna's tubes have been taken out of service due to degradation. Cracked or degraded tubes still in use increase the chances of a significant accident, while a permanent drop in operating efficiency can result if too many tubes are taken out of service.

Ginna's generator problems already have led to a drop in power output of about 3 percent.

The worst accident in Ginna's history occurred in one of its steam generators when, in January 1982, a one-time error triggered a tube rupture. A small amount of radioactive steam released during the episode proved harmless, but underscored the vulnerability of the generators.

Company officials announced last summer that they would not close the plant before 2009 because it would be too expensive to get power from another source. However, they continued to study and debate whether to replace the generators or continue to repair them.

That decision was made formally yesterday by RG&E's board of directors. Company officials said they then announced the plans to employees and government regulators.

Analyst Paul Gioia, a former New York state Public Service Commission chairman, said the decision likely will be good for customers and stockholders.

"It's hard to say without looking at their analysis," said Gioia, senior vice president at First Albany Corp.

"But I think if the analysis was well-done, it will be positive in the sense that it ends the uncertainty and provides a reliable source of power."

The project will be reviewed by the U.S. Nuclear Regulatory Commission but probably will not require a license amendment, said Robert E. Smith, senior vice president of production and engineering at RG&E.

DECEMBER 17, 1995

Project approval is not required from the PSC, but the company must have the PSC's permission in order to charge rate payers for new generators.

The company also would need the PSC's approval to use long-term financing for the project. Kober said RG&E would finance part of the project through outside sources.

PSC Chairman Peter Bradford could not be reached for comment.

The \$115 million price tag includes \$40 million for the generators and \$60 million for installation, with the rest going for engineering and other costs. RG&E will pay roughly \$21 million more to buy replacement electricity during the 90-day shutdown planned for the work.

Ginna now is shut down annually for about 45 days for refueling and maintenance, with as much as a quarter of that time attributable to inspection and repairs of its steam generators.

With the new generators, each shutdown will be of shorter duration, Smith said, and the shutdown cycle will be extended to 18 months, significantly cutting operating costs.

Preparation for the generator replacement will begin at the next routine maintenance shutdown in March. The company will begin an NRC safety analysis of the project, although officials said the project will not be much more risky than routine maintenance.

The old generators, which will be classified as low-level radioactive waste, will be stored in a special building on the Ginna site.

RG&E will award bids for the generators by the end of the month. The generators will be built by either Westinghouse Electric Corp. or Babcock and Wilcox Canada.

Neither company can deliver the generators before late 1995 or 1996, Smith said. They'll be delivered by barge to the plant, which sits on Lake Ontario's shore. The project will provide about 500 short-term construction jobs for union workers.

Company officials would not say whether the new generators would prompt them to seek NRC permission to keep the plant open beyond 2009.

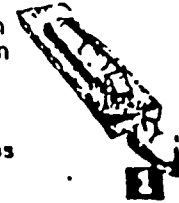


Replacing Ginna's steam generators

In a 67-day project that begins April 1, RG&E will replace both steam generators at its Ginna nuclear power plant. The new generators, which cost \$20 million each, are being assembled in Cambridge, Ontario, about 136 miles northwest of Rochester. Each generator is 63 feet long, up to 14 feet in diameter and 320 tons in weight.

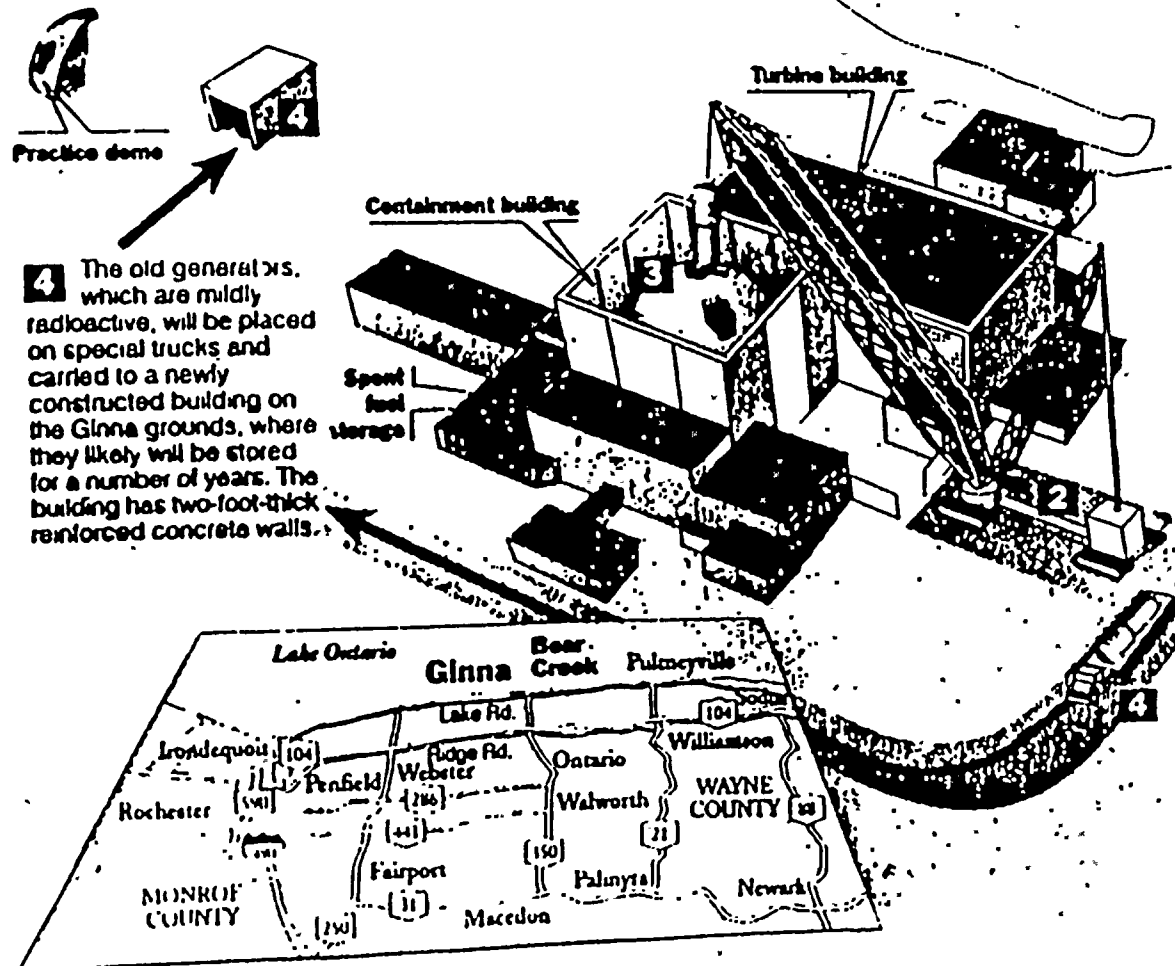
About 350 people will work on the project, which costs a total of \$115 million.

1 The generators will be moved one at a time from Cambridge to the harbor at Hamilton, Ontario, on a trailer twice as wide as that of a normal truck, with about 150 tires. The trailer will be loaded on a barge and sent across Lake Ontario in early February, and then unloaded at Bear Creek, a small harbor two miles east of Ginna. Each new generator, still on the same trailer, will be hauled to Ginna and stored until April.



2 In the meantime, one of the world's largest lifting cranes, with a boom about 310 feet long, will be assembled at Ginna. The Lampson Trans-Lift crane is arriving now on about 100 tractor-trailer trucks from its last job. Three smaller cranes will be needed to help assemble it. After the plant is shut down April 1 and the radioactive fuel is removed, the old generators will be disconnected, drained and prepared for removal. The Ginna containment structure has an equipment hatch in its side but it's not large enough

3 for the generators. So RG&E will be the first utility anywhere to cut open the top of the containment dome to remove old generators and insert the new ones. Workers will use hydraulic jackhammers to cut two large holes in the steel-reinforced concrete roof. In mid-April, the crane will hoist the old generators out, then lower each of the new ones into place. Each generator will take about 12 hours to maneuver into place.



4 The old generators, which are mildly radioactive, will be placed on special trucks and carried to a newly constructed building on the Ginna grounds, where they likely will be stored for a number of years. The building has two-foot-thick reinforced concrete walls.

Replacing Ginna's steam generators

reactor vessel, or might opt to close Ginna early. The latter course of action, though, would undermine the company's plan to amortize the cost of the generators until 2009.

No hint of this problem was evident yesterday as RG&E officials briefed the media on their plans for the mammoth generator replacement project.

Work on the project will begin in earnest four months from now, when workers take jackhammers to the three-foot-thick containment dome that tops the Ginna plant, 16 miles northeast of downtown Rochester in Ontario, Wayne County.

When the jackhammering is completed, workers will have cut two large holes through the reinforced concrete-and-steel dome. RG&E will be the first utility in the United States to cut open the top of its dome.

Then, one of the world's largest cranes will reach through the holes and lift out two 310-ton steam generators, replacing them with two new devices.

Preparation for the project intensified this week with start-up of worker training on a dome mock-up, and the arrival of the first of 150 trucks carrying sections of a Lampson Inc. Trans-Lift crane that has a 300-foot boom.

RG&E says the project is good for its ratepayers. Replacing the steam generators will reduce the need to make repairs and allow the plant to run more efficiently until 2009, when its federal operating license expires, Mecredy said.

RG&E maintains that once refitted, the 25-year-old Ginna plant will be "every bit as good as the day we started up," Mecredy said.

But that's not accounting for the reactor vessel, which has been degrading ever-so-slowly since the plant went into commercial operation in July 1970.

Exposure to the intense radiation of the uranium fuel has caused the vessel to become more brittle.

Of particular concern has been the welding material used to assemble the vessel; small amounts of copper and nickel in the material make the vessel especially prone to embrittlement.

Embrittlement makes the pressurized, super-heated vessel less able to withstand the stress of a sudden drop in temperature, a condition that could occur during an emergency shutdown of the plant.

In an extreme case, regulators have theorized, a vessel could crack under those circumstances — a mishap considered among the worst possible nuclear plant accidents.

Consequently, the NRC three years ago asked owners of some of the nation's oldest plants — including Ginna — to assess the progress of embrittlement in their vessels.

RG&E concluded that its vessel should continue to meet federal safety standards through the expiration of its license in 2009. NRC officials concurred at the time.

But earlier this year, NRC officials reviewed new information submitted by a Michigan utility showing the welding material might have more copper and nickel than thought, increasing the potential for embrittlement.

NRC used that data to reassess a number of plants, and found Ginna would fall below safety standards about the year 2002.

Of all the nuclear plants assessed by the NRC, Ginna was the most severely affected by the new data, according to NRC documents.

Shortly after agency officials informed utilities about the new analyses, RG&E arranged a meeting with regulators in Washington, D.C.

An NRC written summary of the meeting said RG&E officials expressed "concern that the projected shortened life of the reactor vessel would reduce the economic benefit of the steam generator replacement program."

In an interview this week, however, Mecredy said RG&E officials weren't worried about impact of the development on the generator project.

Instead, he said their questions centered on "what had they (NRC) done to get that analysis, when everything we had done before got it beyond 2009?"

Brittleness of reactor vessels can't be measured directly while they are in use.

Instead, experts predict embrittlement based on mathematical formulas.

Also, RG&E was one of many utilities that placed small capsules inside the reactor vessel when the plant was built.

Those capsules contain samples of material used to form and weld the vessel, and can be removed when the plant is shut down for maintenance.

Testing on the contents of the capsules is used to double-check the accuracy of calculations.

Mecredy said data gathered from analysis of those materials is more accurate than the NRC's data.

The NRC's point is that the analysis of welding material gathered at the Palisades plant in Michigan even showed material used within a given plant doesn't have a consistent metal content.

And, as the agency said in public documents earlier this year, "changing the amount of copper content ... by a few hundredths (of a) percent can, for some plants, change the predicted date for reaching the NRC's screening criteria by several years."

Mecredy said RG&E took the NRC's findings into account and still believes the Ginna plant meets the safety standards.

"The basic result was the same," he said.

The \$115 million steam generator project will add \$24.6 million annually to RG&E electricity rates starting next year. But that cost will be offset by savings in operations and maintenance costs at the plant, Mecredy said.

While he said he doesn't know the net impact on rates, Mecredy said the steam generators will account for only a portion of the 2.4 percent rate increase requested for next year.

Even if the impact on rates is as small as Mecredy says, the impact on the community is not. More than 300 local union workers will be hired to work on the project.

In addition, a steady stream of utility-industry officials from as far



Replacing Ginna's steam generators

away as Japan has been visiting the site to see the engineering feat. RG&E has assigned a full-time staffer just to coordinate visits.

While plenty of utilities have replaced steam generators, none has attempted to move them through the top of a reactor dome. RG&E officials say it was their best option, because the size and configuration of the plant made it impossible to get the new generators inside any other way.

Most newer nuclear power plants have equipment hatches large enough for steam generators to pass through.

The project poses no radiation risk to neighbors or the environment, McCreedy said.

During the time the dome is open, the building is to be kept under negative pressure, which should keep air flowing in but not out.

Should that system fail, so little radiation would be released that air monitors around the site would not start to tick, McCreedy said.

Even if the giant crane dropped a steam generator onto the reactor, radiation concerns would be minimal because the highly radioactive fuel rods will have been removed to the "spent fuel pool" in an adjacent building.

RG&E officials say they have configured the job so there is no way the crane or a generator can fall on the pool.

An NRC official in charge of oversight of the Ginna plant agreed there is no radiation risk. "Even in the worst case, no, you wouldn't have any appreciable radiological contamination leaking out," said Ledyard Marsh, a project director at NRC headquarters in Washington, D.C.

Some critics aren't so sure.

"All the information is not being released," said Nancy Kasper, treasurer of Lakeshore Environmental Action, a public awareness advocacy group in North Rose, Wayne County.

"The public needs to know more about the dangers of radiation."

The group asked for a public meeting on the issue and expressed concerns about the safety of the 25-year-old plant.

In a prepared statement issued yesterday, the group worried the Ginna facility would become "a permanent nuclear dump" once the old generators are stored there.

"I have a real concern" about opening the dome, said geographer Judith Johnsrud of State College, Pa., director of the Environmental Coalition on Nuclear Power, a group that 25 years ago tried — and failed — to delay the licensing of the ill-fated Unit 2 at Three Mile Island. "It's experimental — and that means we don't know."

Marsh said, however, that other plants have replaced generators and one facility has cut into the side of its containment building to do so.

Marsh also asserted the RG&E project "has been very carefully thought about by us and by them. We had our technical experts think long and hard about it."

RG&E did not have to submit a formal construction safety plan to the NRC, Marsh said, because similar jobs by other utilities convinced the agency that none was needed.

Still, the NRC is keeping close watch on the project.

"We have an aggressive inspection program that's going to take place," Marsh said.

A group of NRC inspectors is due at the Ginna plant today, Marsh said.

RG&E officials say they aren't taking any chances, both for safety and economic reasons.

If one of the new steam tube generators falls, \$20 million worth of intricate steel tubing hits the dirt.

Worse yet, if the generator should fall inside the plant, it could cause enough damage to other equipment to shut down Ginna for months — or even cause RG&E to close the plant altogether.

But RG&E officials say such an accident is highly unlikely.

"We did a lot of investigating before we settled on the Lampton crane," said John F. Smith, RG&E project manager for the steam generator replacement.

"Those cranes have been used for thousands and thousands of lifts at nuclear power sites and there has never been a failure of a crane," Smith said.

But the Lampton cranes have tipped "two or three" times due to the collapse of soil or roads under their weight, Smith said.

The crane used at Ginna will weigh 2,590 tons.

The most spectacular such accident occurred at Edwards Air Force Base in California in 1990.

The ground gave way beneath one of the crane's giant treads, causing the boom to fall — along with a Titan 4 rocket motor containing 270,000 pounds of solid fuel.

The rocket rolled down a hillside and exploded. A worker was killed.

To guard against a similar occurrence here, RG&E has built concrete pads two- to three-feet thick for the crane to work on, and has removed utility conduits and other underground weak spots from the area.

Before the generators are lifted, the crane will be moved through the work area carrying weights equal to 125 percent of the weight of the generator, Smith said.



Replacing Ginna's steam generators

Engineers face tight deadline on generators

By CORYDON IRELAND
STAFF WRITER

Precision engineering and a tight deadline highlight the steam generator replacement project at Ginna.

The bulk of the work will take place in just 67 days, between April 1 and June 6. Workers will put in 12-hour shifts, around the clock, in order to get the plant running again.

One of the most delicate jobs — removing the old generators through holes in the containment dome — will take about 12 hours for each generator.

The interiors of the old generators are radioactive, so all openings will be sealed with steel plating before the hoisting begins. The 63-foot devices also will be swathed like a mummy in what RG&E project manager John Smith calls "Baggies," two layers of tape and Griffah-runk polyvinyl.

After being pulled from the containment building by the crane, each of the generators will be lowered onto a special vehicle and driven a few hundred yards to a new storage building on site.

That building, with concrete walls two feet thick, will be home to the generators — officially, low-level radioactive waste — until the federal government builds a new waste storage facility. That will take years.

After the new generators are in place, the containment dome will be resealed in stages.

First, 1½-inch-thick steel plates will be welded back in place over the holes. Then a new dome wall of reinforced concrete will go up, 30 inches thick and reinforced with three intersecting layers of 2½-inch steel reinforcement bars.

To make sure the patch will hold, the containment structure will be pressurized to 70 pounds per square inch, 10 pounds over its designed capacity, said Robert C. Mecredy, vice president of Ginna Nuclear Production.

At the peak, about 350 people will be working on the project, including 300 welders, pipefitters, crane operators and others from local trade unions. Another 150 workers will also be working on regular plant maintenance and refueling.

RG&E is responsible for training workers on radiation safety and security. All workers will wear two types of radiation monitors, including one that monitors cumulative exposure and sounds an alarm when a worker nears his or her radiation limit, Mecredy said.

Neil Burnside, president of the Allied Building Trades Council, said he is satisfied with the radiation training provided by RG&E. However, the NRC scolded the company last month because workers were not wearing radiation alarms. Mecredy said the problem involved only "a few entries over a couple of months." RG&E has added new security devices that bar people from "radiologically controlled areas" unless they are wearing the alarms, he said.

Bechtel Construction Co. of California, which gets \$50 million to act as general contractor for the project, has been working closely with union officials since February to coordinate hiring and construction training and to resolve on-the-job disputes. Both sides say they are pleased with their "labor-management alliance," which they say is making for an efficient and safe job.

RG&E officials said that the project is running on time and on budget. The entire steam generator replacement is budgeted at \$115 million, Mecredy said. □

Replacement timeline

Here's the timeline for the Ginna steam generator replacement project:

June 1995: Construction of storage facility for used steam generators.

July to October: Construction of mock-up dome and steam generators; pouring of foundations for the giant crane.

October to November: Bear Creek Harbor dredged for barges carrying steam generators.

December: Delivery and assembly of the Lamoson crane.

Mid-February 1996: Steam generators shipped by barge from Hamilton, Ontario.

February to March: Worker training.

April: Plant shutdown and reactor fuel removed. Containment dome cut and steam generators removed.

Late April to mid-May: Installation of new steam generators.

May: Resealing of containment; structural integrity test.

June: Start-up of plant

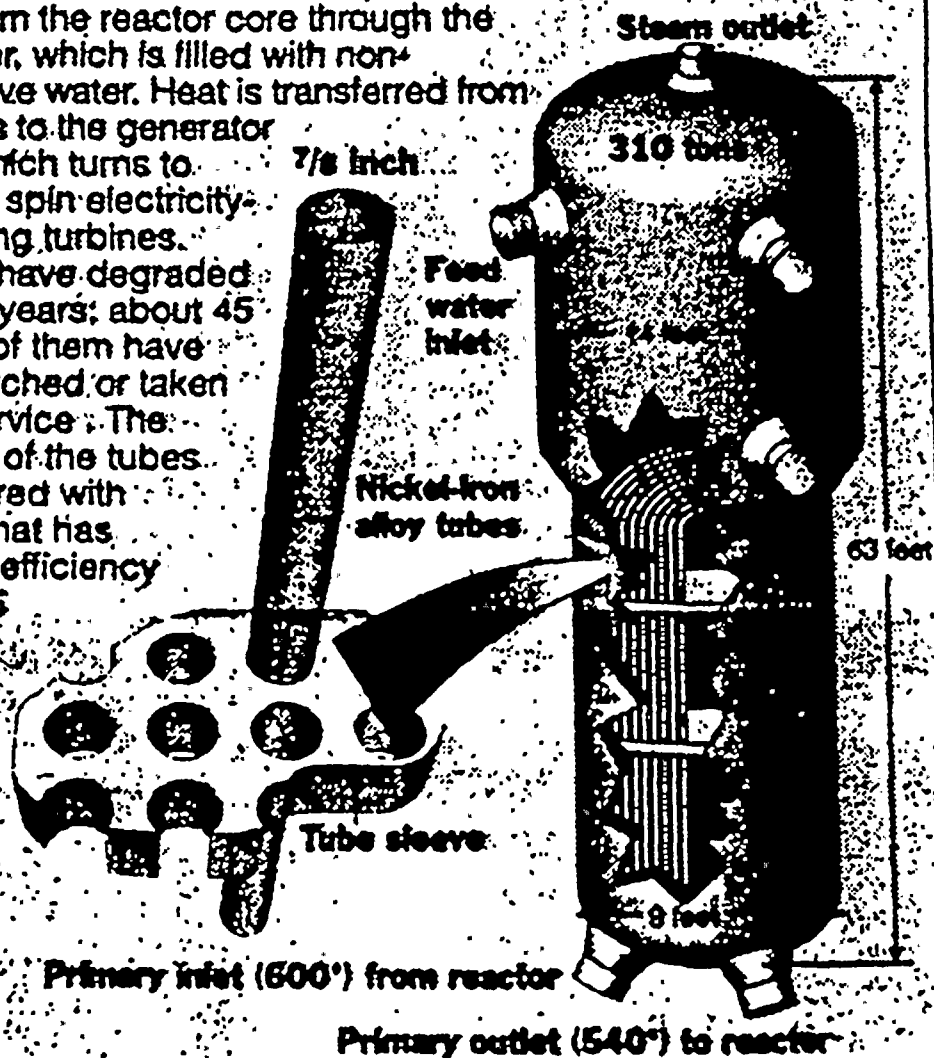


Replacing Ginna's steam generators

The steam generator

Ginna's 63-foot-tall generators each contain 3,280 small tubes of super-heated water from the reactor core through the generator, which is filled with non-radioactive water. Heat is transferred from the tubes to the generator water, which turns to steam to spin electricity-generating turbines.

Tubes have degraded over the years; about 45 percent of them have been patched or taken out of service. The exteriors of the tubes are covered with scaling that has reduced efficiency about 3.5 percent.





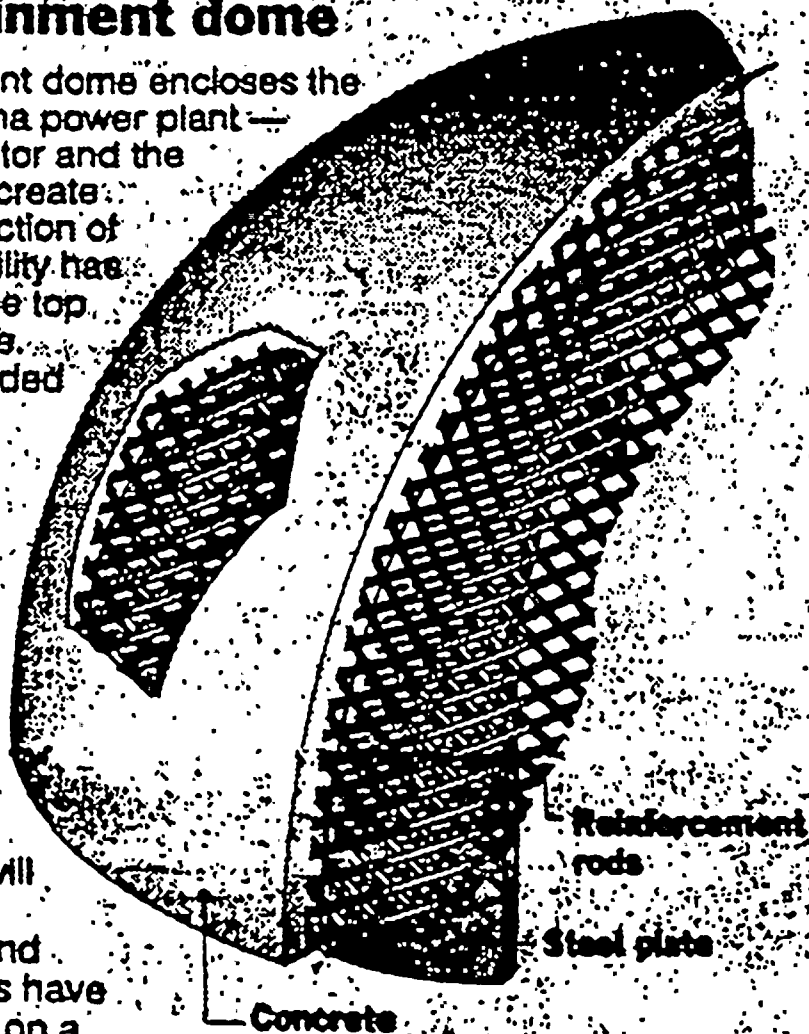
Replacing Ginna's steam generators

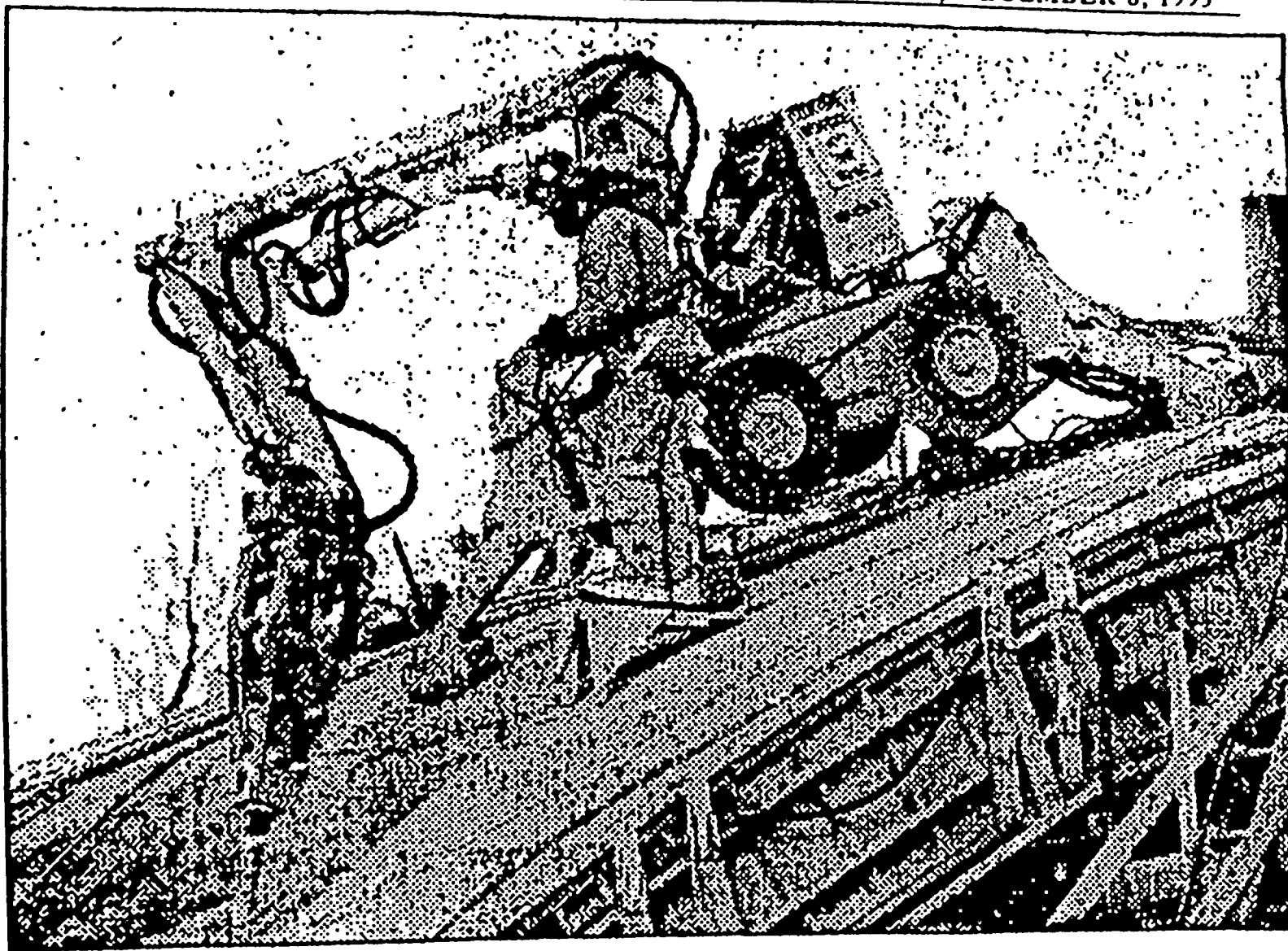
The containment dome

The containment dome encloses the heart of the Ginna power plant — the nuclear reactor and the generators that create steam for production of electricity. No utility has ever cut open the top of a dome before. The dome, intended to keep all radioactive materials inside while withstanding severe assaults from outside, is made of 30-inch-thick

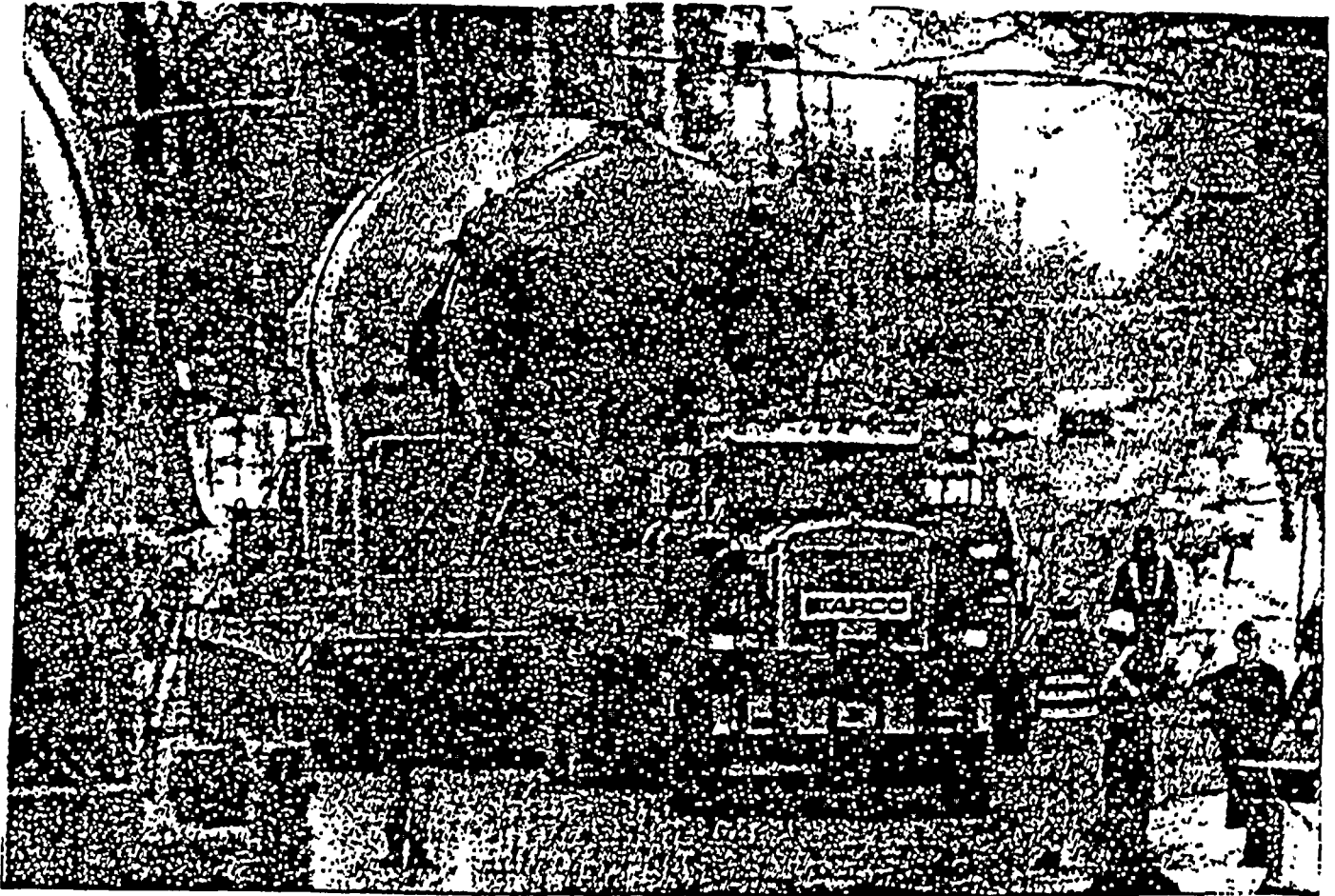
concrete.

To cut the holes, workers will use hydraulic jackhammers and torches. Workers have been practicing on a mock dome. After the new generators have been installed, the plate will be welded back in place and new concrete will be poured.





Practice session A worker yesterday trains for the heavy-duty but delicate job of hammering holes in the Ginna power plant dome.



Huge vehicles hauling steam generators to be installed at the Ginna Nuclear Power plant are maneuvered through an intersection in Waterdown, Ont., Canada, yesterday. The generators weigh 316 tons each.

Huge burdens wend way to Ginna

By CORYDON IRELAND

Staff writer

WATERDOWN, Ont. — Blocked roads and stalled traffic slowed life down even more than usual yesterday in this little rural community north of Hamilton.

Trundling through town at a top speed of 6 mph — complete with a

police escort — were two gigantic tractor-trailer rigs. Each carried a house-size steam generator from Babcock & Wilcox Power Generation Group, a manufacturer in Cambridge, Ont.

Final destination: the Robert E. Ginna nuclear power plant, 16 miles east of downtown Rochester in Ontario, Wayne County.

The 63-foot generators, worth \$20 million each, by June will replace the aging models now on site.

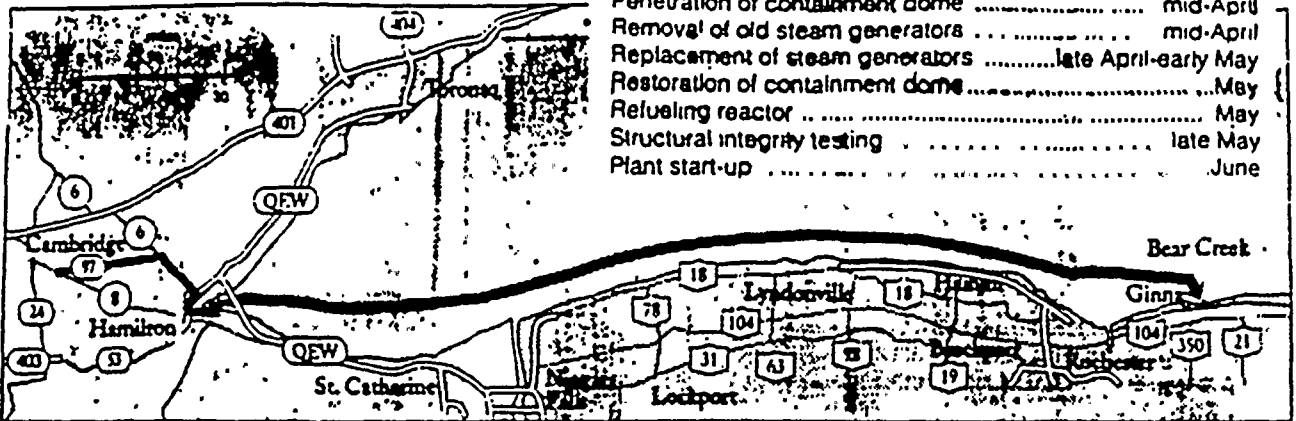
A convoy of utility trucks led the way yesterday, while workers raised power and phone lines higher with poles and cherry-pickers.

"I thought they were making a mov-



On their way to Ginna

Map shows route new steam generators will travel to Ginna plant for renovations in April



SOURCE: Rochester Gas and Electric Corp.

HERN AUC H staff artist

Burdens wend way to Ginna

From page 1A

ie," said Waterdown resident Caroline Eaton, who drank coffee and watched as the 333-ton carriers lumbered past hanging stoplights.

By today, the slow convoy should reach the Port of Hamilton, where the 316-ton units will be shipped one at a time across Lake Ontario, starting as early as Jan. 25.

The new models — assembled in Canada from Italian, French, Japanese and Canadian components — are the heart of the \$115 million Ginna replacement project, due to wrap up in June.

The Waterdown leg was halfway through a 50-mile, three-day journey through urban Ontario that took three years to plan.

The trip is costing "a fair truck of money," said Bob Eckert, the Babcock engineer overseeing the generator project. He declined to be more specific.

The German-built hydraulic carriers, pushed and pulled by two

trucks each, are wide, high, long and heavy. So every fraction of a kilometer along the way had to be checked for sharp turns, weak roads, fragile culverts, power lines and steep hills.

At 3 a.m. today, the rigs were due to make a 15-minute crossing of the busy Queen Elizabeth Way.

"There's never been anything like this in Waterdown, to my recollection," said Jan Henry Dunnick, a retired dairy farmer who grew up down the road from the intersection of Main Street and Parkside Avenue, where one rig paused after clipping and severing a cable-television line.

Dunnick tapped at the carrier's welded saddles with his cane and peered at its array of 224 radial tires. At either end, the Kenworth trucks idled powerfully.

"Some of these trailers are good for 800 tons," said Tim Sittler, vice president of ETARCO, Ltd., the Cambridge firm hired to do the 50-mile haul. "It's something we do every day."

Ginna's giants

Including tractors at the front and back, each rig toting Ginna's new steam generators is:

- 150 feet long.
- 21 feet wide.
- 19.5 feet high.
- Weighs 333 tons.
- Costs \$2.5 million.
- Carries 600 gallons of fuel and a crew of five.

Hitched between two trucks, one of the Scheuerle hydraulic transport carriers has 192 high-pressure radial tires. The other has 224.

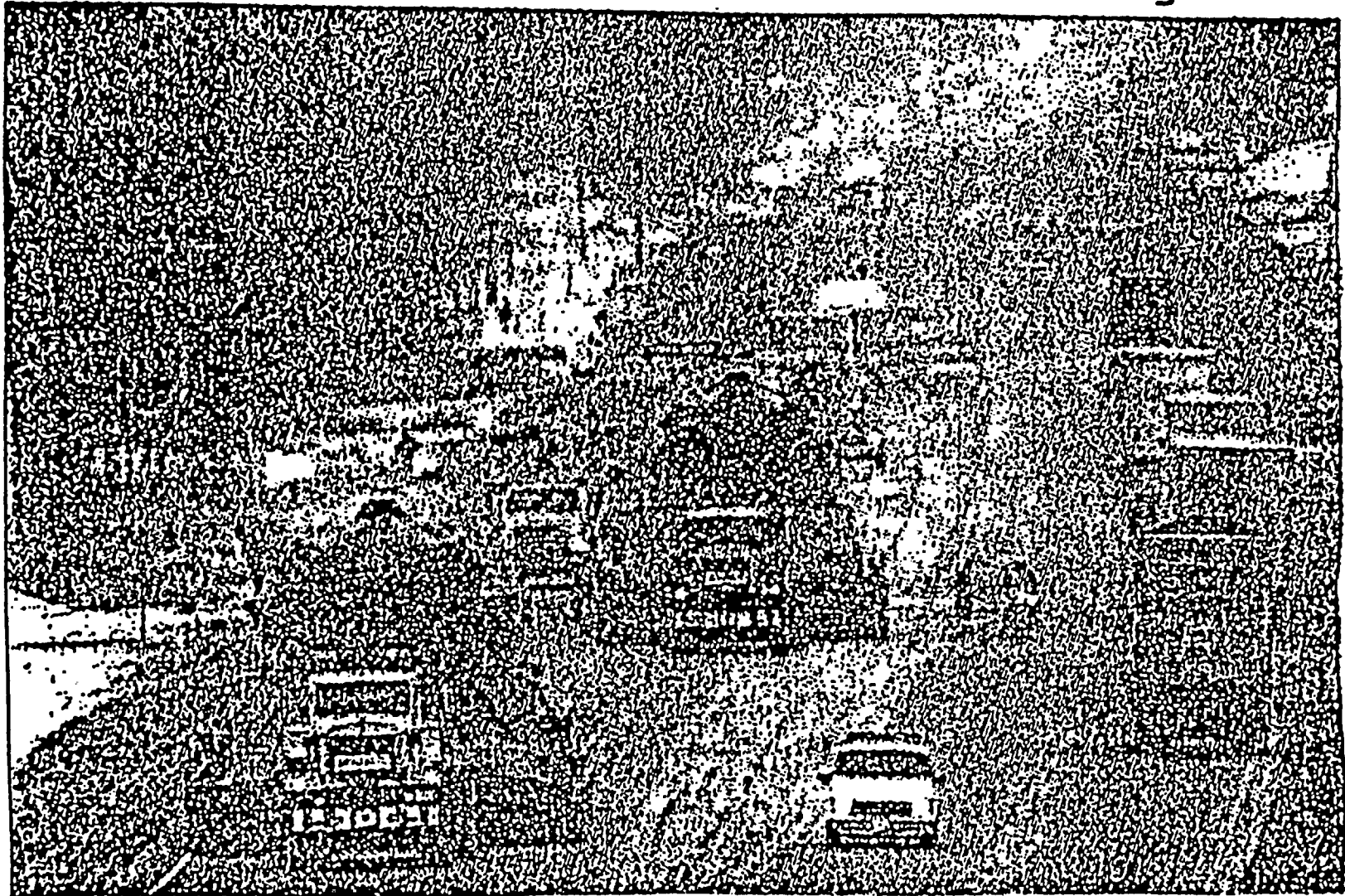
SOURCE: Babcock and Wilcox International

But a mix of busy highways, rural roads and dense populations made this 50-mile trip more interesting — and complicated — than Babcock's kingsize shipments to Korea, said Ennio Valente, a project engineer.

By 3 p.m. today, the generators, wrapped in weather-proof blue plastic, are due at the port.

Mountain of gear crawls to Ginna

JANUARY 17, 1996



Ruling the road Two steam generators, each weighing 316 tons, ride carriers at a leisurely pace along Highway 6 in Ontario, Canada, yesterday. Units will replace worn out parts at RG&E's Ginna plant.

Canadians marvel at mighty burden moving at 6 mph

JANUARY 17, 1996

WATERDOWN, Ont.

Blocked roads and stalled traffic slowed life down even more than usual yesterday in this little rural community north of Hamilton.

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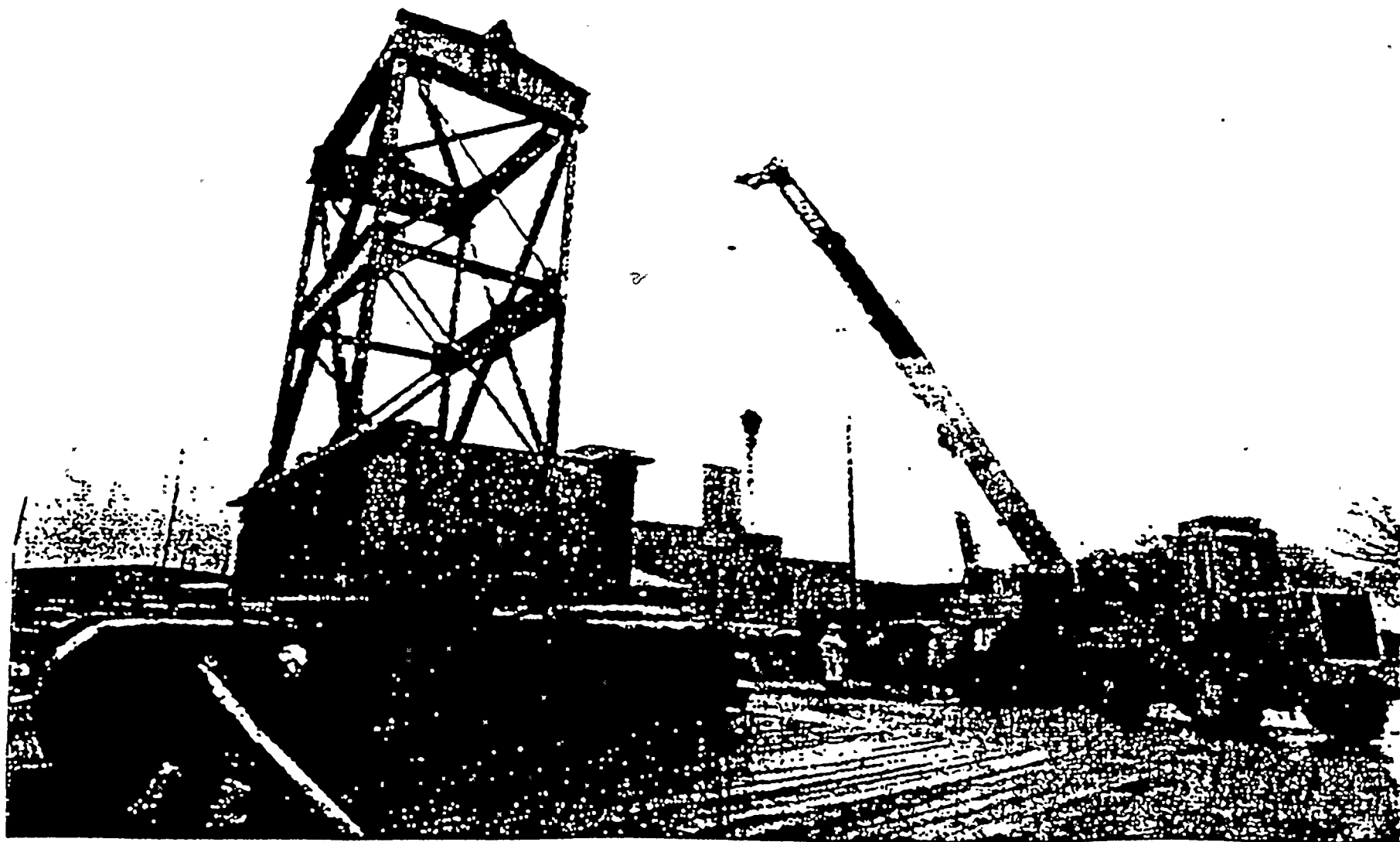
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By 3 p.m. today, the generators, wrapped in weatherproof blue plastic, are due at the port.

"Everything went better than planned," said Eckert, who settled in for dinner near Guelph after the rigs were parked for the night. "We're ahead of schedule."

A freezing rain was starting to patter down, he added. But with three extra days built into the schedule, he said, weather was unlikely to delay the move. □

JANUARY 18, 1996



Does it plow snow? A Ginna worker is dwarfed by one of two heavy-treaded "crawlers" that will power a 360-foot crane now being assembled in a former employee parking lot outside the nuclear power plant in Wayne County. One of the largest cranes in the world, it will be used in late April to lift two new steam generators through a hole in the plant's containment dome



Workers ready huge crane for Ginna

JANUARY 18, 1996

ONTARIO — Helmeted workers at the Robert E. Ginna nuclear power plant yesterday scurried through a steady drizzle, assembling parts for one of the world's largest cranes.

The 36-story tall Lampson Series 2A crane, with a lift capacity of 1,200 tons, will be used by mid-April to place two new steam generators into a hole in the 25-year-old containment dome.

The \$115 million project has been in the planning stages since 1992. It will be the first generator replacement using a hole in the

containment dome, said plant officials.

But similar projects have been completed in Sweden, Wisconsin and Michigan, they said. Two others are planned, for Florida and Illinois.

"In some regards, this (crane) is the easy part," said Robert C. Mecredy, vice president of nuclear operations at Rochester Gas & Electric, which operates Ginna.

On the menu in the coming month, he said: Final assembly of the crane, after six weeks of work; a 445-ton test lift of the crane, lumbering it up for the 350-ton lifts in April; and continued training of workers hired for specialty weld-

ing and drilling through the containment dome.

The six-month replacement project, wrapping up in June, is ahead of schedule and slightly under budget, said RG&E project manager John F. Smith.

It will take about 60 days. Radiation escaping from the dome, stripped of its reactor fuel rods, will be "point zero, zero something millirems," said Mecredy.

By comparison, annual background radiation in the Rochester area adds up to about 280 millirems a year, said Franklin H. Orienter, an RG&E radiation safety expert. "We're talking about tiny, tiny, tiny numbers."

The 316-ton generators, strapped to centipede-like carriers with hundreds of wheels, crept this week over 50 miles of urban and rural roadways on a three-day trip from an Ontario manufacturer to the Port of Hamilton.

They arrived safely yesterday afternoon. The first generator, trundled onto a 200-foot Black Carrier barge by Jan. 25, will be pushed across Lake Ontario by three tug boats. The new generators, wrapped in bright blue plastic, are due to arrive at Bear Creek harbor, 1.5 miles east of Ginna, on Jan. 27 and Jan. 31.

For updates on the project, call 1-800-964-4662. □

Weather may delay trip to Ginna

By CORYDON IRELAND
STAFF WRITER

Chancy weather might delay the further transport of the first of two new steam generators bound for a local nuclear plant, an official said.

The \$20 million device, strapped to a three-tug barge, is now docked at the Port of Rochester in Charlotte after a 20-hour trip this week from Hamilton, Ontario.

"The weather is beginning to get a little iffy," said Mike Power, spokesman for Rochester Gas & Electric Corp., which operates the Robert E. Ginna nuclear plant in Ontario, Wayne County. "We're certainly not going to take any chances."

The forecast calls for brisk winds and snow tomorrow, the day the barge is scheduled to travel on Lake

Ontario to Bear Creek Harbor. Plans call for the first 316-ton generator to arrive at Bear Creek Harbor, 1 1/2 miles east of Ginna, then be trucked to the plant Saturday.

The Canadian-built steam generators are the centerpieces of a \$115 million refurbishment of the 25-year-old nuclear plant.

The 67-day construction project, kicking off in April, involves cutting two holes in the reactor containment dome and inching the generators into place with a 36-story crane.

Power said negotiations were under way to find a "proper and safe location" for spectators who want to see the crane — one of the world's largest — in operation.

While some people are eager for a close look, others want to keep their distance.

RG&E officials met this week

with the Cayuga County Environmental Management Council. Members had voiced concern about radiation releases. Northern Cayuga County is within Ginna's 50-mile emergency planning zone.

The council asked for copies of monitoring reports and independent monitoring of radiation releases at Ginna, said Power.

The documents will be supplied after a written request. But independent monitoring is "a government issue," Power said. "We're not getting in the middle of that. It's not a cost our customers should bear."

RG&E maintains six monitoring stations at Ginna and five off-site.

"That's like asking the fox to watch the chickens," said Linda Dowling, a former radiation researcher at State University College at Oswego. □



JAMIE GERMANO was photographer

On view Fred Miller, left, and Bob Seebold yesterday traveled to Charlotte to take a look at a 316-ton, Canadian-built steam generator that is bound for Ginna nuclear power plant in Wayne County.

JANUARY 24, 1996

Barge carrying cargo for Ginna plant makes stop

A barge carrying a \$20-million steam generator bound for the R.E. Ginna Nuclear Power Plant stopped at the Port of Rochester in Charlotte yesterday.

The 316-ton Babcock & Wilcox generator is one of two scheduled for replacement during a \$115 million upgrade at Ginna.

It is being shipped across Lake Ontario from Hamilton, Ontario.

The barge made an unscheduled stop in Charlotte because a change in weather was predicted for later this week and barge operators wanted a larger port to protect their cargo from winds, said RG&E spokesman Mike Power.

The generator is expected to arrive late Friday at Bear Creek Harbor, 1½ miles east of Ginna.



JANUARY 29, 1996

Winds thwart delivery

By CORYDON IRELAND

Staff writer

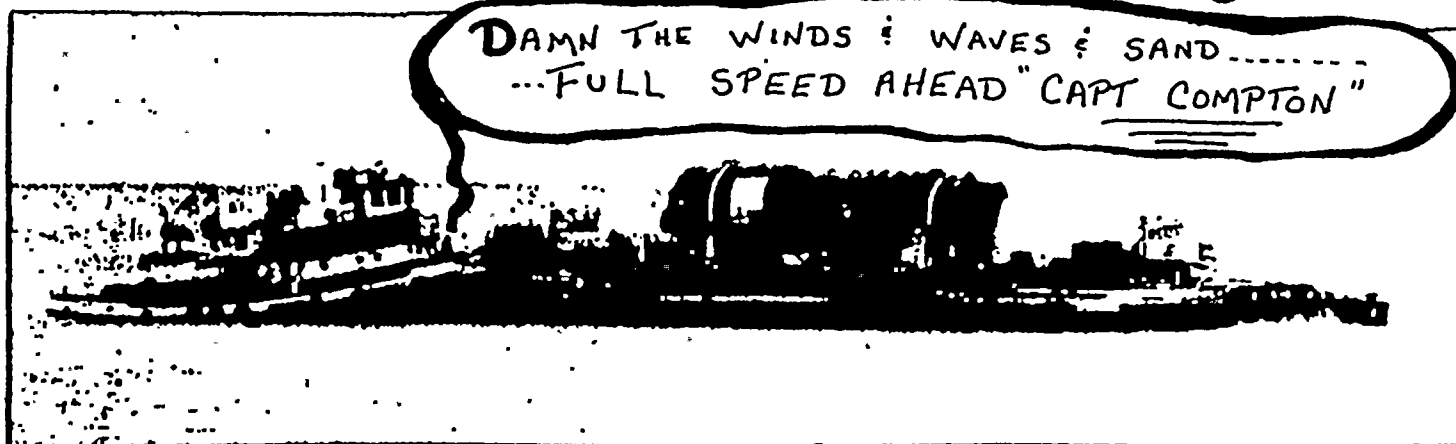
With bustling winds and chop currents on Lake Ontario, Mother Nature stepped on plans this morning to thread a loaded barge into the narrow mouth of Bear Creek harbor.

On board is the first of two \$20 million steam generators bound for the Robert E. Ginna nuclear plant 1 1/2 miles west of the freshly dredged creek.

The tilt foot devices, swaddled in heavy blue plastic, will replace by June the aging models now on site at the 25-year-old plant.

After two hours of futile maneuvering hundreds of yards from the mouth of the creek, the barge finally headed back to safety at the Port of Rochester in Charlotte.

"It's not the story I wanted to be giving you today," said Mike Power, spokesman for Rochester Gas & Electric Corp., which



A barge carrying one of RG&E's new steam generators crosses Lake Ontario this morning

owns the plant. "The weather changed faster than predicted."

RG&E project manager John Smith said the attempt — predicated on a 12-hour window of clear weather — "went

down the tubes faster than we thought."

Power said officials will watch the weather day by day. But another attempt to dock and unload will probably not unfold until the end of the week.

The delayed delivery of the 320-ton generator, strapped to a 224-tire rig, will not delay the \$115 million renovation project, scheduled to wrap up in June after a 67-day shutdown.

February 1, 1996

Tug carrying Ginna generator runs aground

By DORIS WOLF

Staff writer

ONTARIO — A two-tug barge carrying a 316-ton steam generator snagged on rocks today at a harbor on Lake Ontario, thwarting Rochester Gas & Electric's attempt to move the generators into the harbor, which is less than two miles east of the Robert E. Ginna nuclear plant.

As the 40-foot-wide barge threaded into a channel only 60 feet wide at Bear Creek, it ran into resistance. More than 100 feet of the craft jutted into the lake as divers were called in to assess the situation.

RG&E spokesman Mike Power said the company checked the 8-foot-deep channel two weeks ago, using both sonar and divers, and everything appeared to be OK. RG&E plans to move two steam generators to the plant.

Under the best conditions, the barge — with 6 feet of draft and 40 feet wide — was going to be a tight fit. In November, the harbor channel was dredged to 8 feet deep.

Silt and rocks may have been washed into the channel by last weekend's storm, Power suggested.

The generators are the centerpieces of a \$115 million project to upgrade Ginna, a 25-year-old plant that at 490 megawatts produces 50 percent of RG&E's electric power.

The company plans, by late April, to cut two holes in the containment dome and replace two aging steam generators. The new units, worth \$20 million each, are being shipped in via Lake Ontario from Canada.

An attempt to land the generator Monday was thwarted by high winds and waves, and the barge returned to Charlotte Harbor.

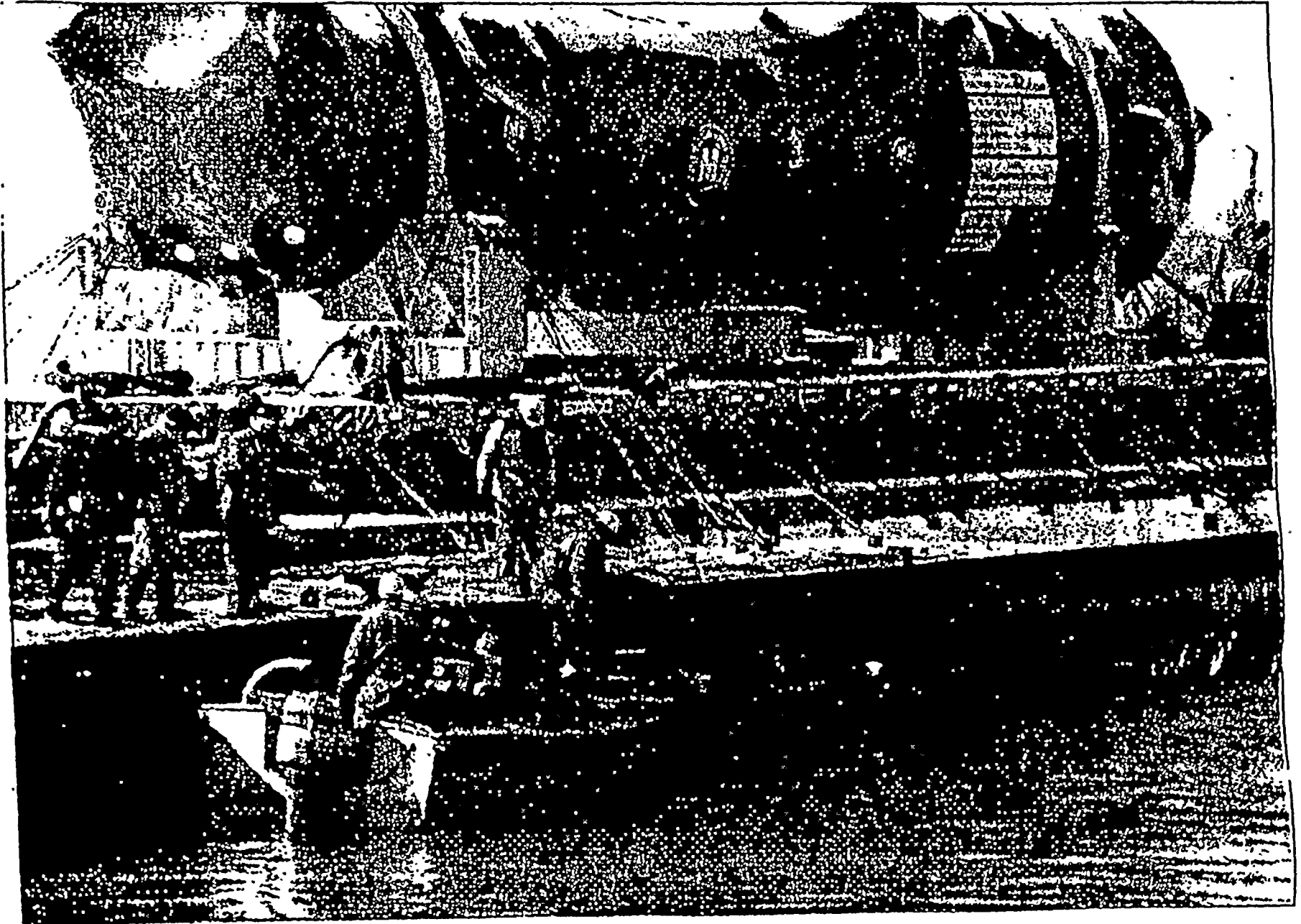
If the barge cannot be landed today, Power said, it would back off and make the four-hour return trip to Rochester.

"I'm trying to be optimistic," he said. "We're going to make that call hour by hour."

Despite frigid air and bone-chilling winds, a stream of onlookers walked along the shoreline taking pictures of the stranded barge.

Silt thwarts RG&E's plans at Bear Creek

FEBRUARY 2, 1996



Divers go under a barge bringing a steam generator to Ginna nuclear power plant to see how it got stuck yesterday. The huge delivery came to a halt on its way into Bear Creek. Had it in 1996.



Silt thwarts RG&E's plans at Bear Creek

FEBRUARY 2, 1996

Steam generator gets stuck

**Barge hits bottom
with 316-ton load
near Ginna plant**

By DORIS WOLF
STAFF WRITER

ONTARIO — Rochester Gas and Electric Corp. learned an important lesson yesterday: "Winters can be cruel in upstate New York," spokesman Mike Power said.

RG&E officials watched as a barge carrying a 316-ton steam generator got stuck at the mouth of Bear Creek Harbor, less than two miles from its desti-

nation, the Robert E. Ginna nuclear plant. The 40-foot-wide barge came to a dead stop as it threaded into a channel only 60 feet wide.

Divers discovered that high winds over the weekend had washed silt into the U-shaped channel, building up as much as two feet on the sides and turning the channel into a V shape.

Power said RG&E checked the 8-foot-deep channel two weeks ago, using both sonar and divers, and everything appeared to be OK.

Bruce McKenzie, assistant project manager for on-site contractors Bechtel Power Corp. said the barge captain decided to call off the attempt to land the barge.

"He was concerned if he made the run it could possibly push the barge into

the rock," McKenzie said. The barge returned to Charlotte Harbor.

An attempt to bring the barge in Monday was halted by rough weather.

The generator is one of two that are the centerpieces of a \$115 million project to upgrade Ginna, a 25-year-old plant that at 490 megawatts produces 50 percent of RG&E's electric power.

This spring, the company plans to cut two holes in the plant's containment dome, pull out its aging steam generators and replace them with new ones. The two units, worth \$20 million each, are being shipped from Canada.

The replacement project is the most expensive and potentially riskiest repair job ever attempted at Ginna.

Power said RG&E will now decide whether to dredge the harbor. □



Critic: RG&E hiding information on Ginna

FEBRUARY 8, 1996

ALBANY — State regulators are improperly withholding from the public information about Rochester Gas and Electric Corp.'s Ginna steam-generator project, a critic charged yesterday at a hearing here.

"It's very important that the public have a feel for the prudence of this investment," said Charles Straka, a retired Xerox worker who is an independent party in the rate case.

"Was it prudent? I can't answer that question. It's a little frustrating," he told Administrative Law Judge Walter T. Moynihan, who was conducting the hearing.

RG&E is seeking the permission

of the state Public Service Commission to raise rates by \$17 million for a year starting in July. Rates for residential customers would go up 3 percent, while those paid by larger users would increase 1.6 percent.

However, the staff of the commission has recommended that RG&E cut its rates by 3.5 percent for each of the next two years, and the state Consumer Protection Board recommended a 1.5 percent cut starting July 1.

Moynihan is expected to hear testimony for the rest of the week, and issue his opinion sometime in April. The full commission is expected to issue its ruling this summer.

The \$115 million project to replace the steam generators in the

Wayne County nuclear plant, designed to prolong its life and make it more efficient, has emerged as a key issue.

But some information about it has been kept from the public because it is considered a trade secret. Among that information is how much the commission staff thinks the project will cost ratepayers in excess costs over the next five years and how much money has already been spent on it.

RG&E lawyers have argued successfully to the commission that disclosing that and other information would be useful to its competitors.

Moynihan said the issues considered trade secrets will be discussed at a closed hearing. Straka said it's not clear whether he will be

allowed to attend that closed session, but that if he is he would have to pledge not to disclose anything about it.

Straka is allowed to participate in the process because state law allows individual citizens to have a formal role.

Also at the hearing, a commission staffer said recent cuts in interest rates may mean the company should be entitled to less profit.

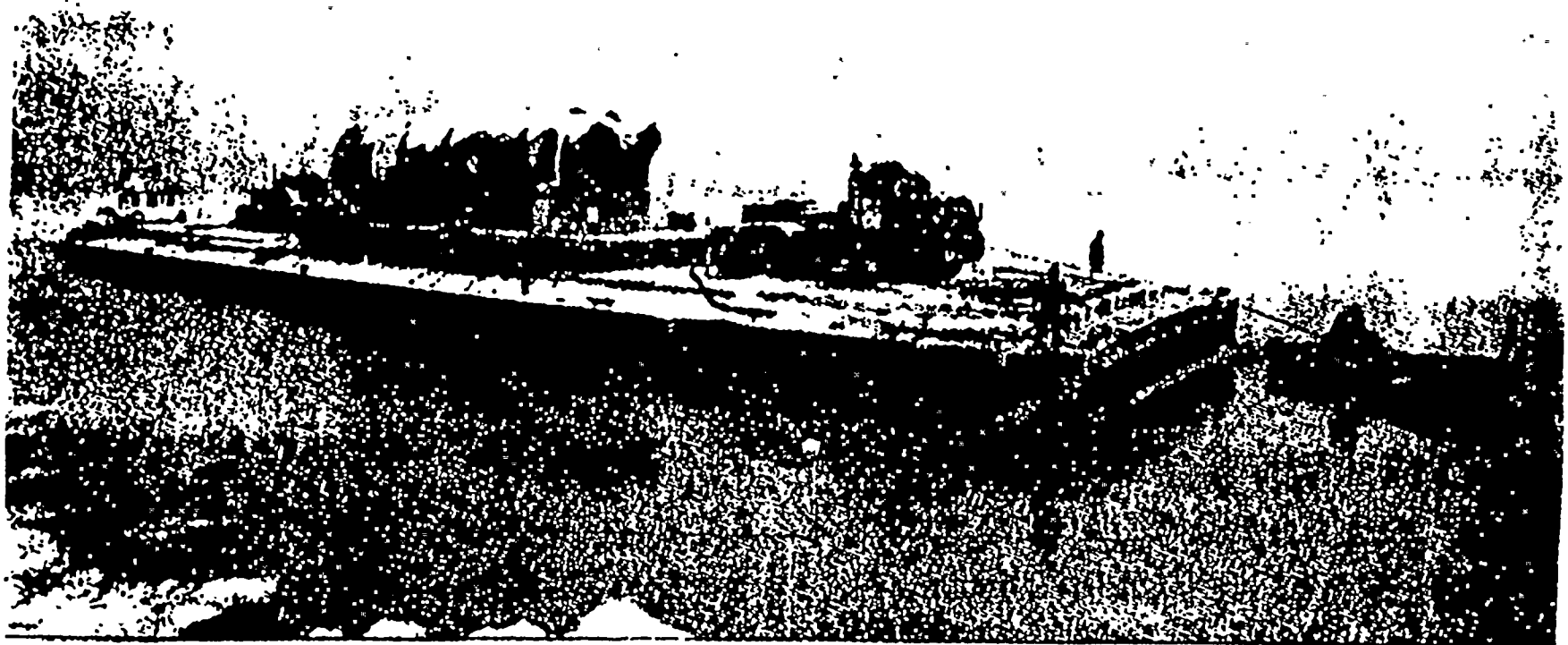
The commission staff would allow a 10.5 percent return on equity for a one-year deal and 10.9 percent each year of a two-year agreement.

RG&E, on the other hand, wants 11.1 percent for a one-year rate agreement and 11.3 percent for each year of a two-year pact. ■



FEBRUARY 8, 1996

New generator arrives at Ginna



A barge carrying RG&E's new steam generator passes through the channel that leads to Bear Creek yesterday.

FEBRUARY 8, 1996

New generator arrives at Ginna

Barge heads back to Canada for 2nd load

By DORIS WOLF

ONTARIO — The first of Rochester Gas and Electric Corp.'s two new steam generators spent last night indoors and on dry land for the first time in weeks.

For the next month it will remain in a storage facility while it is prepared to be lifted by the world's largest crane through a hole in the containment dome at the Ginna nuclear power station.

As part of a \$115 million project, RG&E is replacing the station's two generators, giving the 25-year-old plant an

extended life.

Spokesman Mike Power said the company will shut down the reactor at the end of March and remove the radioactive material to an underwater storage facility.

Two holes will be cut in the containment dome in mid-April. The project is expected to be completed by mid-June, and is on schedule, Power said.

The first 316-ton generator arrived at Bear Creek Harbor yesterday morning to the delight of the crew that has labored in frigid and "inhuman" temperatures to clear away silt and ice from Lake Ontario to allow passage to the lakeshore.

The arrival also delighted the "generator groupies," about 50 local residents who have braved wind and freezing tem-

peratures for the past week to record the progress of the big machine.

The barge immediately began a return trip to Ontario, Canada, to begin bringing the second generator to Wayne County.

Meanwhile, as the generator's convoy passed Knickerbocker Road, Jo and Pieter som de Cerff came out on their porch to record the event on their Kodak cameras. "We saw the generators go by 30 years ago when Ginna was built," Jo som de Cerff said. "This time we thought we'd take pictures."

But not everyone was thrilled. Karen Pinkney, who lives near the power plant, said she and her husband are concerned about what will happen when the dome is cut open.



Generator's arrival cheered by crowds

FEBRUARY 8, 1996

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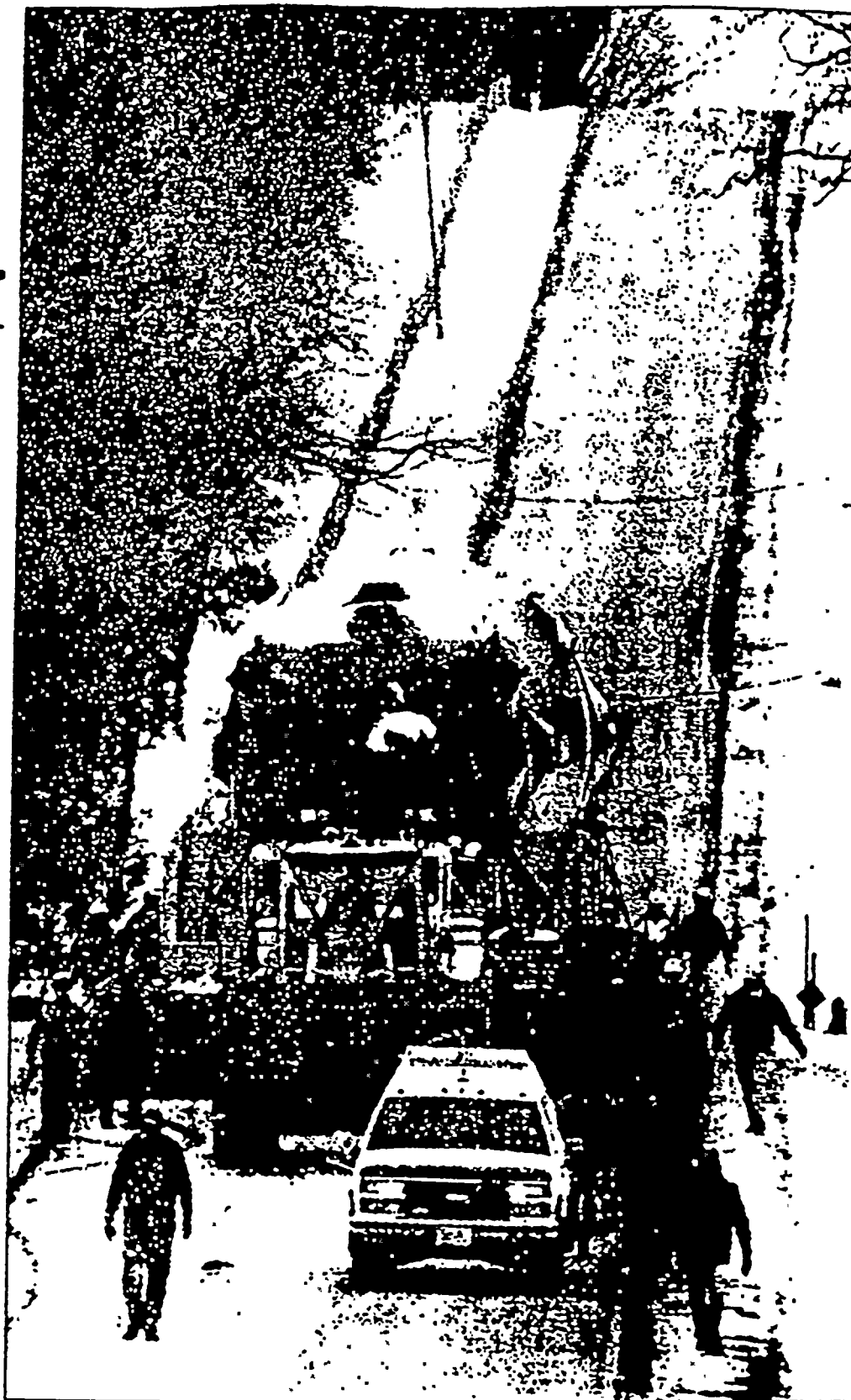
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The arrival also delighted the "generator groupies," a crowd of about 50 local residents who have braved wind and freezing temperatures for the past week to record the progress of the big blue-wrapped machine with their cameras and camcorders.

The barge immediately began a return trip to Ontario, Canada, to begin bringing the second generator to Wayne County.

Crowds of onlookers gathered at driveways and intersections to cheer as the parade of sheriff's vehicles, county highway workers and power line trucks — and the generator, of course — passed. □



Generator parade Rochester Gas and Electric Corp.'s new steam generator slowly trundles along a Wayne County road yesterday to the Ginna nuclear power plant.

February 13, 1996

JUST ASK ...

Question: Why were the new generators for the Ginna nuclear power plant built in Canada?

Answer: That's because Babcock and Wilcox International of Cambridge, Ontario, was the low bidder, explained Mike Powers, RG&E spokesman. The company makes steam generators used all over the world, he added. It is a fixed-price contract, he noted, which means any cost overruns will have to be absorbed by the manufacturer or installer. □



Unless you have been living on another planet, the arrival of the new steam generator at the Ginna Nuclear Plant in the Town of Ontario should not have been a major surprise this past week.

Weather be damned! The first of the two new steam generators finally arrived at the Ginna Nuclear Plant, located on Lake Road in the Town of Ontario. Delayed from arrival by a freak winter storm that necessitated additional Bear Creek Harbor dredging, the 316 ton generator inched its way off the barge and onto a huge wheeled platform for the final leg of its voyage.

A crowd of anxious watchers gathered and some actually walked behind the metal monster as it paraded at an average speed of 1 mile per hour to the Ginna grounds.

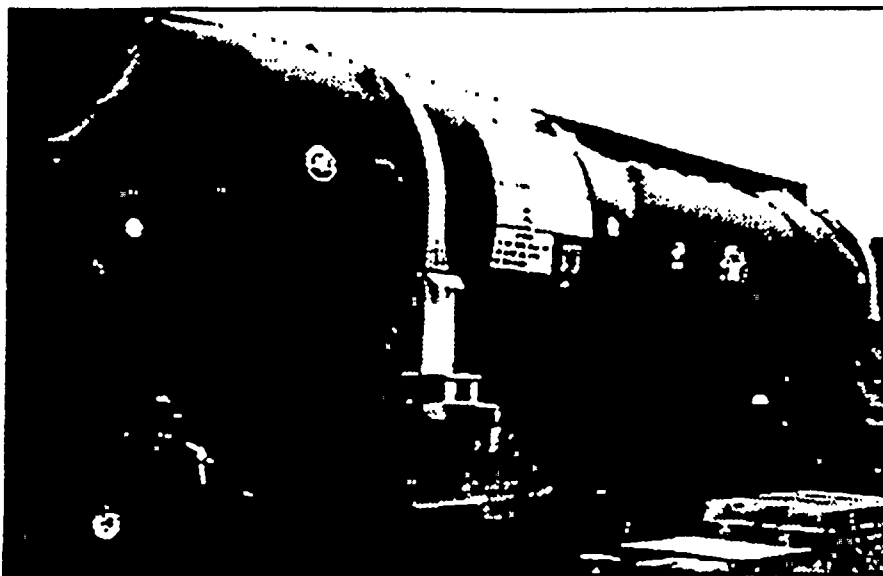
Manufactured in Cambridge, Ontario, the generator worked its way southward towards the Rochester port, via a barge ride along Lake Ontario. Wrapped in a blue plastic covering, the first generator was pushed by three tugboats.

The generator was filled with nitrogen gas to keep the internal workings of the first stage of the \$40,000,000 project dry. All the valves and caps were welded shut to ensure the carbon steel beast would not rust.

Rochester Gas & Electric knew the windows of opportunity for shipping the generators were close. Upon its safe arrival the barge would return to the Port of Hamilton, Ontario Canada for the sister generator. The second generator should arrive early this week.

Due to the closing of Lake Ontario to normal shipping during the winter months, the two new generators had to be shipped separately on the only barge large enough to handle the 63 foot high, 13' 6" diameter steam generators.

Quick! What Weighs 316 Tons & Crawls Along Lake Road In Ontario At 1 Mile Per Hour?



The first of two new steam generators arrived at the Ginna Nuclear Plant on Lake Road in the Town of Ontario last week. The second sister generator will arrive this week.

Licensed in 1969, the Ginna plant original generators were losing efficiency. The older 320 ton technology needed to be upgraded. With 50% of the Rochester area power created by the nuclear facility, the new generators would ensure a power flow till the year 2009 when the plant's 40 year license expires.

Years in the planning moved to the next stage as armies of workers descended on the Ginna Plant to prepare for the enormous task.

The concrete roof of the generator house will be opened carefully to allow for the old generator removal and the new units placement sometime in April. A new concrete bunker appearing housing

will store the low grade radiation contaminated generators for the next several years. New technology is being developed, according to RG&E spokesman Mike Powers, that will allow for the eventual salvaging of most of the valuable metals in the old generators.

Other crews are working on the 310 foot boom, 190 foot mast, massive crane that will be employed to do the lifting. The 316 tons of generator should be easy work for the rated 1200 ton crane. Six miles of cable will be employed as the crane, with a ground speed of 1/2 mile per hour, carefully maneuvers its cargo into place.

Second Ginna generator awaits good weather news

ONTARIO — One moved and one to go.

Having safely transported one steam generator to the Ginna nuclear power plant, Rochester Gas and Electric Corp. officials will begin studying weather patterns at the end of this week to decide when to try for the second one.

RG&E spokesman Mike Power said the second generator arrived in Rochester Saturday and was taken up the Genesee River to the Boxart Street docks for storage.

The site, where cement boats dock, is protected from high winds, Power said.

"The workers, the community, the tug boat operators and all the people who gave the first boffo performance are waiting in the wings to do it again," Power said.

...As part of a \$115 million project, RG&E is planning to cut a hole in the containment dome at the 25-year-old nuclear power plant in mid-April and replace the station's two generators. The project is to be completed by mid-June.

It took three tries before the first of the two 315-ton generators could be transported to Bear Creek Harbor last week.

The company plans to evaluate the weather forecasts at the end of the week before deciding when to attempt to bring the barge carrying the second \$20 million generator to Bear Creek Harbor.

"Any day of the week, including the weekend, is an option," Power said.

During a storm earlier this month, high winds created a 5-foot sandbar at the mouth of the harbor, thwarting one of the attempts to bring in the first generator.

This time, the company plans to dredge the harbor and take soundings before the barge is moved from the Genesee River. Power said.

February 15, 1996

RG&E looks at weather for second Ginna load

ONTARIO — One moved and one to go.

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MARCH 3, 1996

Ginna safety no worry?

RG&E says its plans to shield workers on nuclear project far exceed standards; critics cite risk

■ Exposure to radiation

Rem is a unit used to measure ionizing radiation. More commonly used is a millirem, 1/1000 of a rem. Here are some amounts of radiation for comparison:

Radiation

Millirems, per year

Federal limit for occupational radiation, per worker

5,000

Average on-the-job dose to all workers at Ginna

2,000

RG&E recommended limit, per worker

350

Average background radiation in Rochester area, with radon*

320

Average background radiation in U.S., with radon*

300

Average background radiation in Rochester area, without radon*

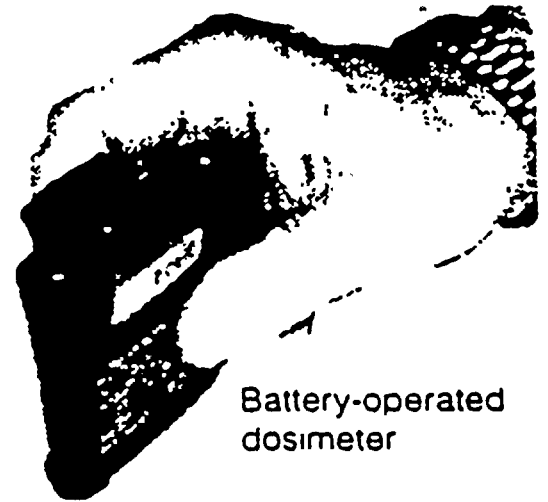
120

Average chest X-ray (total, not per year)

10

*Radon is a radioactive gaseous element in some soil

Dangerous dose: A one-time dose of 50,000 millirems causes observable damage, such as changes in blood chemistry or chromosomes



Battery-operated dosimeter

■ Measuring exposure

To enter a radiation area, a worker logs in on a computer at the site

The computer verifies the worker's authorization to be in the area. The computer also transfers information to a

dosimeter, a small device about the size of a pager that measures radiation. The dosimeter is set with a maximum radiation dose rate for the worker

for that day. The worker inserts the battery-operated dosimeter

into a turnstile, it releases to admit the worker to the area. The worker carries the dosimeter in the breast pocket of the anti-contamination suit. It will sound an alarm if the worker reaches the allowable dose or if radiation present in the work environment exceeds a set limit



Protecting Workers at Ginna

Workers in radiation areas at the Ginna nuclear power plant routinely wear protective clothing to shield skin from contact with radioactive particles in dust or other material. Systems also are in place to monitor the amount of radiation exposure each worker receives

The anti-contamination suit

Material

Suit is made of nylon with a zipper up the front

Respirator

In operations where radioactive particles may become airborne, such as welding, a respirator is worn over mouth and nose

Glasses

Thick plastic safety glasses cover eyes.

Dosimeter

A thermoluminescent dosimeter on name tag tracks cumulative radiation exposure during job.

Gloves

Rubber gloves with cotton liners are worn on hands.

Underneath

Under protective suit, workers wear hospital-style scrub suit.

Cleaning

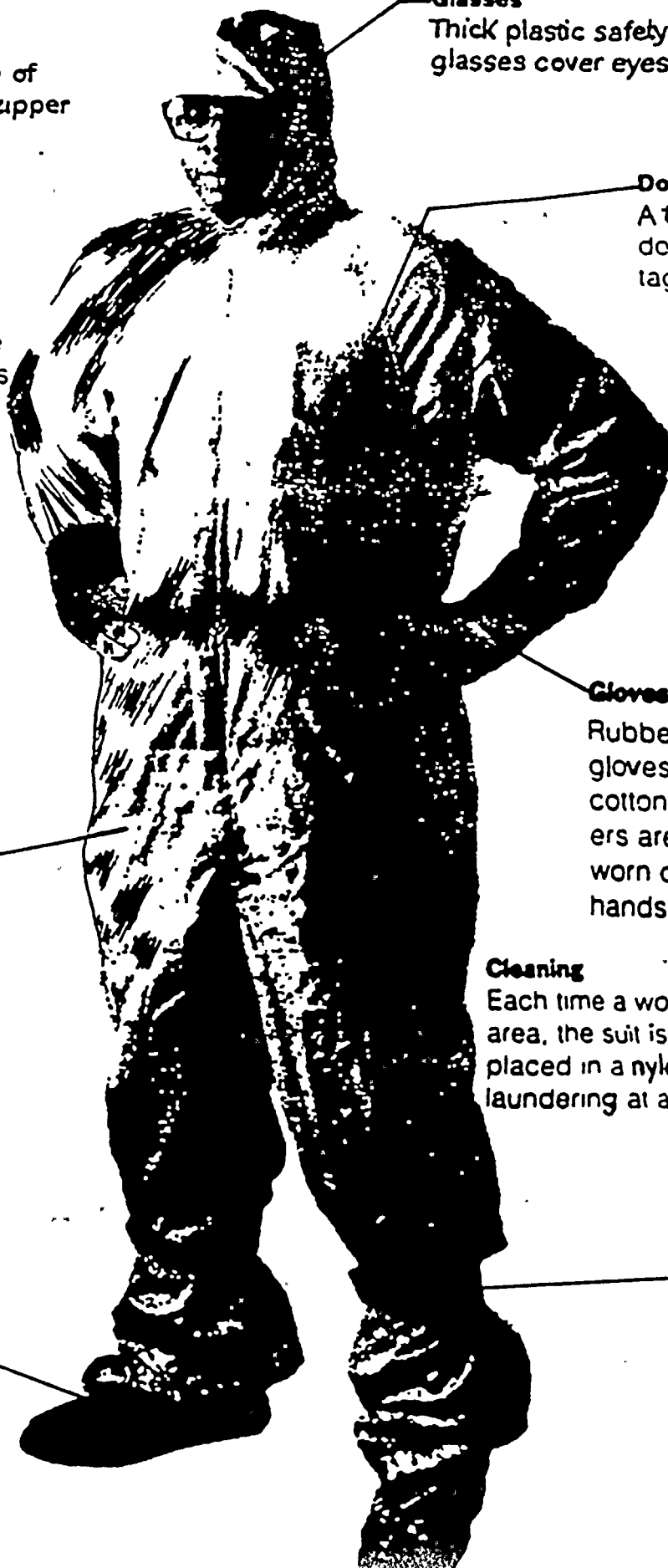
Each time a worker leaves a radiation area, the suit is carefully removed, placed in a nylon bag, then sent out for laundering at a special off-site facility.

Booties

Rubber booties are attached to suit

Elastic bands

Black elastic bands with snaps secure suit at ankles and wrists



MARCH 3, 1996

Ginna safety no worry?

Radiation levels still a hot topic

Safety programs at Ginna assume that radiation exposure inside the power plant poses a risk to workers.

RG&E officials say the risk is very small. But since it isn't zero, they look for more ways to lower the doses workers receive, says Richard J. Watts, manager of nuclear assessment.

This theory — that even the smallest amount of radiation poses some risk to human health — has influenced regulations for worker safety and environmental protection. But the "linear, no threshold model" has detractors in the scientific community who argue there is a level below which radiation poses no danger.

Some researchers even claim small amounts of radiation actually are good for people. But that's going too far, says R. David Maillie, associate professor of biophysics at the University of Rochester.

Yet Maillie also says there's little evidence to support the radiation dose limits imposed by the Nuclear Regulatory Commission. Long-term studies on nuclear workers fail to show any health impact until levels reach four times the NRC's

allowable annual dose of 5,000 millirems, he says.

Further studies, including analysis of people exposed to radiation from the 1986 nuclear disaster at Chernobyl in Ukraine, eventually will persuade regulators to up their dose limits, believes Maillie, who oversees UR's radiation safety programs. But that change could take a decade.

Raising allowable radiation levels would be unwise, counters Judith Johnsrud, a former Pennsylvania State University geographer who sits on that state's advisory committee on radioactive waste. Research on Chernobyl shows that, besides leukemia and other cancers caused by high radiation doses, very low levels of environmental radiation weaken immune systems, Johnsrud says.

Children, in particular, are showing increased incidents of asthma, gastro-intestinal problems and chronic fatigue, she notes. The worker health studies cited by Maillie "probably are not looking at the full range of consequences" of low radiation doses, she says.



MARCH 3, 1996

Improved radiation controls

Comparison of person-rem of radiation exposure during other steam generator replacements in the U.S. (Person-rem measures the total rem of exposure received by all workers on a project.)

Year	Person-rem/generator
1980 Surry 2 (Va.)	714
1981 Surry 1 (Va.)	588
1982 Turkey Point 3 (Fla.)	717
1983 Turkey Point 4 (Fla.)	435
1984 Point Beach 1 (Wis.)	295
1984 Robinson (S.C.)	402
1989, Cook 2 (Ill.)	140
1989, Indian Point 3 (N.Y.)	135
1991, Palisades (N.Y.)	338
1993 Millstone 2 (Conn.)	335
1993 North Anna 1 (Va.)	80
1994 Summer (S.C.)	75
1995 North Anna 2 (Va.)	47.5

RG&E aims to hold exposure during the Ginna project to 55 person-rem per generator

3 types of radiation

Gamma: High-speed electromagnetic waves that travel great distances, can be shielded by lead, steel, concrete and water. Gamma rays have no physical mass.

Beta: Negatively charged particles that travel small distances, can be blocked by plastic or wood.

Alpha: Positively charged particles that travel very short distances, can be blocked by paper. Present in small amounts at Ginna. Alpha and beta particles are most dangerous if ingested.

Ginna timetable

April 1: plant shutdown begins

Early April: fuel removed from nuclear reactor vessel

Mid-April: two holes cut in top of reactor's containment dome; old steam generators lifted out through the holes

Late April: new steam generator "A" lowered through hole and welded into place

Late April or early May: new steam generator "B" installed

May: holes patched in containment dome, reactor refueled

Late May: patched dome tested for structural integrity

June: plant restarted

R&E says its plans to shield workers on nuclear project far exceed standards; critics cite risk

MARCH 3, 1996

Nuclear power plants don't scare Bill Jones. He's a master mechanic with the International Union of Operating Engineers, one of about 350 contractors hired for the steam generator replacement project that begins April 1 at the Ginna nuclear power plant in Ontario, Wayne County.

Many of them are experienced nuclear workers who travel from plant to plant, but others are new to the drill for dealing safely with radiation.

Jones, in fact, hasn't worked at a nuclear plant since the late 1960s, when he helped build Ginna's water intake tunnel — a job with no radiation exposure. This time, he'll go inside the plant to work on a small crane used to move rigging. Because he'll be working around radioactive equipment, Jones will be required to wear special clothing and clip-on radiation monitors called dosimeters.

Although he's likely to receive a measurable dose of radiation, "I have no qualms about it whatsoever," says Jones, who's worked outside at Ginna for the past year to prepare for the delivery and installation of the two 310-ton generators. "I don't feel radiation is any problem."

Yet the safety of those exposed to radiation is by no means a foregone conclusion, especially on this project. Nuclear critics say replacing steam generators is a particularly "hot" or radioactive job, which will increase workers' long term risks of cancer or other health problems.

Rochester Gas and Electric Corp. insists that workers always are safe at Ginna and says the generator replacement involves routine radiation levels. Nonetheless, the project design has been influenced by the company's desire to limit workers' radiation dosage, says Richard J. Watts, manager of nuclear assessment.

The old steam generators require special handling because, after more than 25 years of operation, they're contaminated with radioactive corrosion left behind by the reactor water.

Superheated water from the reactor core, where nuclear fission takes place, is pumped through more than 3,000 tiny pipes inside each steam generator. Heat from the pipes boils water in a secondary system, that water flashes to steam, which powers energy-producing turbines. Because the nuclear fuel assemblies inside the reactor sometimes leak, the water that flows through the steam generators is contaminated with radioactive material, some sticks inside the pipes.

High-energy gamma rays from this radioactive corrosion will permeate the steel skins of the generators and pose a danger to workers who must move them, says Paul Gunter, director of the Reactor Watchdog Project with the Nuclear Information and Resource Service in Washington, D.C. The protective clothing issued to workers does not shield them from these rays.

At greater risk are the welders who will cut loose the old generators and then attach the new generators to the reactor pipes, Gunter says. In addition to gamma radiation, they risk exposure to radioactive particles that could escape from inside the old generators and the piping.



MARCH 3, 1996

● Ginna safety no worry?

Exposure is down

RG&E officials argue that radioactive exposure at Ginna is going down, not up. General housekeeping has improved from the plant's early days, the fuel assemblies aren't as leaky and engineers have learned how to adjust the chemistry of the reactor water to reduce corrosion, Watts says.

Technology also has made a big difference, he says. Workers once had to crawl inside steam generators to make visual inspections, that work now is done with remote-control equipment.

Robotics, decontamination and lead shielding all have helped eliminate high radiation jobs at Ginna and other plants, Watts says. Gone are the days when a worker would hit his annual radiation limit in a couple of shifts.

Nuclear utilities face considerable peer pressure to continue to reduce worker exposure, Watts says. And they've made substantial progress.

The Nuclear Energy Institute says the median plant-wide radiation dose for pressure-water plants such as Ginna was 414 rems in 1984. By 1994, the median was 144 rems.

Deregulation shouldn't change the emphasis on radiation safety because many of the practices that cut radiation doses, such as better training and planning, also improve plant efficiency, Watts says.

At the same time, the driving force behind the worker radiation standards at RG&E has been the assumption that on-the-job exposure carries "some small but finite risk," Watts says. So the company believes it's prudent to keep exposure as low as reasonably possible. Watts says he doesn't expect that philosophy to change.

For the NRC's part, it will make sure utilities don't use deregulation as an excuse to cut corners on worker safety, Dricks says. The agency, which was beat up badly in a *Time* magazine cover story last week for being soft on violations at a Connecticut plant owned by Northeast Utilities, will be getting tougher under new NRC Chairwoman Shirley Ann Jackson, Dricks said.



MARCH 3, 1996

Constant monitoring

Inspectors from the federal Nuclear Regulatory Commission will be monitoring worker exposure throughout the job and will audit records afterward to determine the overall worker dosage, says NRC spokesman Victor Dricks. No adverse health impact on workers is expected because utilities have learned over the years how to minimize exposure on steam generator replacements, Dricks says.

In fact, RG&E and general contractor Bechtel Power Corp. — part of the Bechtel Group Inc. of San Francisco — say they will draw on this experience in fulfilling their pledge to keep the overall radiation dose the lowest of any steam generator replacement completed in the country to date.

RG&E already sets individual radiation limits below the federal requirements, which allow a worker to receive an annual on-the-job dose equal to 16 times the environmental background level. (Radiation is naturally present from such sources as rocks, the sun's rays and outer space.) No workers are expected to exceed the RG&E limit during the job, Watts says.

The company's decision to remove the generators in one piece instead of cutting them in two will go a long way to reduce radiation doses, he explains. Robotics also will help. Pipes that link the steam generators to the reactor vessel will be cut by remote controlled equipment.

That's key because the bottom portions of the old generators emit up to 300 millirems of radiation per hour. A worker standing right next to the generator would get 6 percent of his annual allowed dose in one hour, although the exposure would be considerably weaker only a few feet away, Watts says.

After the old generators are cut loose from the piping, the openings on the vessels will be capped with steel plates. Then the 67-foot-tall generators will be sealed in special bags to prevent any residual radioactive liquid or particles from spilling during transportation to a storage building.

One of the 'hottest' jobs

Although the new generators aren't radioactive, welding them into the system will be one of the "hottest" jobs of the project. The open pipes from the reactor are corroded with radioactive material, so workers will be exposed to additional gamma rays and, potentially, to radioactive particles.

RG&E is using two tactics to reduce exposure for welders:

- Hiring special contractors to decontaminate the first 18 inches of the open pipes, using abrasive grit and sponges;

- Training the welders on mock-ups of the generators so they will be able to complete the actual job as quickly as possible.

The NRC will allow welders on some generator replacements to go without respirators if they can finish the work faster and cut the overall radiation dose. But Gunter of the Reactor Watchdog Project argues there's no gain in cutting the gamma dose if workers instead ingest radioactive particles. Radioactive particles are more difficult to detect inside the body and sometimes impossible to remove.

Watts agrees that working without respirators isn't much of a tradeoff. Welders on Ginna's replacement will wear respirators unless it's determined later that airborne radiation is not a problem, he says.

In this and other radiation safety matters, RG&E takes the most conservative approach, Watts maintains. Perhaps that's why Ginna seems to have a good reputation among workers.



Ginna safety no worry?

Eager for Ginna work

Union welders have been eager to sign up for the good-paying jobs at the generator project, says Ronald Behan, business manager for Local 13 of the United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry. Radiation isn't a worry at Ginna because plant officials are careful about monitoring exposure, decontaminating piping and using lead shielding to block gamma rays, Behan says.

"Our people have done a lot of work out there at the nuclear plant. We've been very satisfied with the monitoring and everything else."

The NRC, which issues a report card for each nuclear plant every 18 months, gave Ginna a "good" ranking for radiation protection in a report last May. (Good is the second-best rating, below "excellent.") Inspectors said RG&E had made steady improvements in reducing worker exposure but added that "areas for growth still exist."

The improvements cited include the increased use of lead shielding and the redesign of the entry to the containment dome to block workers from entering without their dosimeters. Creation of an outage exposure reduction committee also was praised.

The James A. FitzPatrick nuclear plant in Scriba, Oswego County, came in for harsher criticism on its last report card in December. NRC inspectors found that some workers were wearing their dosimeters backward, which can cause low readings, and that equipment used to check workers for radiation contamination was either broken or used incorrectly.

The New York Power Authority, which runs FitzPatrick, responded by implementing a new radiation training program for full-time and contract workers. Radiation technicians also are being given more training.

Despite such improvements, the Reactor Watchdog Project predicts that working conditions at most plants are destined to backslide under the economic pressures of utility deregulation, Gunter says. Nuclear plants are expensive to operate compared with coal-or gas-fired generators. Utilities worried about how their nuclear plants will compete are pressuring the NRC to cut inspections and requirements to replace worn-out parts, he says.

Yet workers in aging nuclear plants such as Ginna need greater safeguards because aging plants are more radioactive, according to Gunter. The longer they operate, the more radioactive "crud" builds up in their systems; more repairs are needed, and those jobs are more radioactive.

"There is no threshold dose for safe exposure to radiation," Gunter says. "Consequently, any worker exposure to harmful radiation is still too much."



Ginna shares how power works

Crowds react well to plant's opening

MARCH 4, 1996

ONTARIO - When 10-year-old Adam Rath of Walworth declared, "It's pretty cool," he wasn't just talking about yesterday's weather.

Adam was among the 1,600 people who visited the Ginna nuclear power plant yesterday to learn how a nuclear power generating station works.

They stood in line to pull levers that operate the world's largest crane, stared at the massive 316-ton steam generators that

will be inserted into the containment dome this summer, and watched lasers and robots help workers complete their jobs accurately, quickly and with the least exposure to radiation.

Rochester Gas and Electric Corp. officials said 2,500 people visited Ginna on Saturday.

"This is shocking to me," said Jack St. Martin, one of the RG&E employees who volunteered to serve as tour guides during the two-day open house. "I only expected about 1,500 people for the two days."

The visitors came away impressed.

Many, like Richard Ross of Rochester, brought their children and their videocameras.

"I'm an operating engineer, so

I'm interested in the crane," Ross said as he filmed a model of the containment dome in the power station's visitors center.

RG&E plans to cut holes in the containment dome, use a crane to lift the two aging steam generators out and replace them with two new, \$20 million steam generators. The project is expected to be completed in June.

"I live at ground zero," said Carol Trout, who was visiting the plant for the first time. "I came to find out the facts and visit a powerful, important neighbor."

In the simulated control room, Adam listened as plant operator Kevin McLaughlin demonstrated how engineers control the nuclear reaction to keep the power production steady.

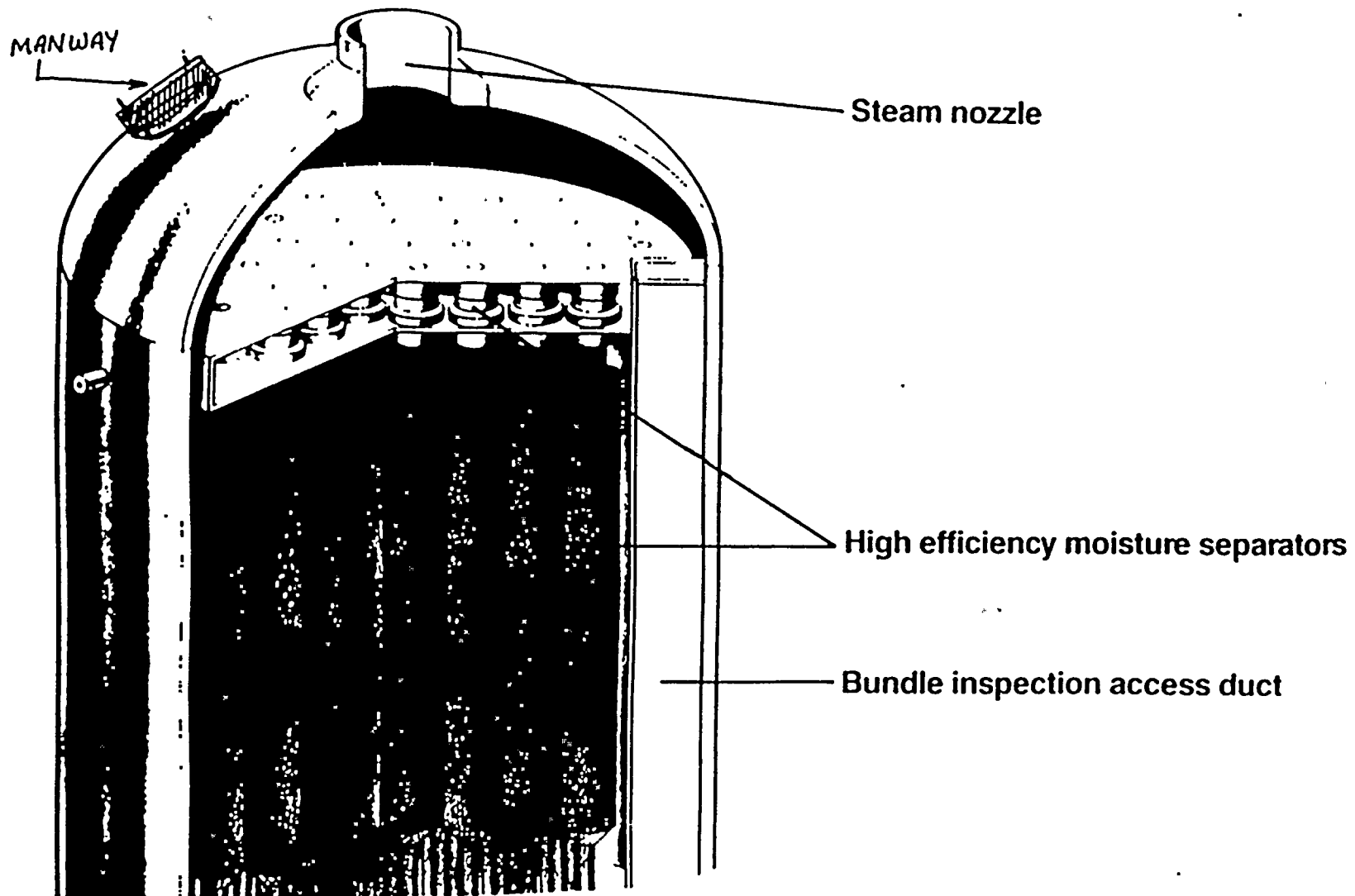
Then, McLaughlin asked Adam to help with the demonstration and operate simulated control rods to reduce or increase the nuclear chain reaction. Lights flashed, bells rang and other warning signals were activated, which showed how the rod movement affected the electrical output of the plant.

Mark Lesinski and Pam Sergeant of Webster, members of Ginna's radiation protection group, demonstrated how robots will be used to ensure that the new generators' fittings are perfectly sealed.

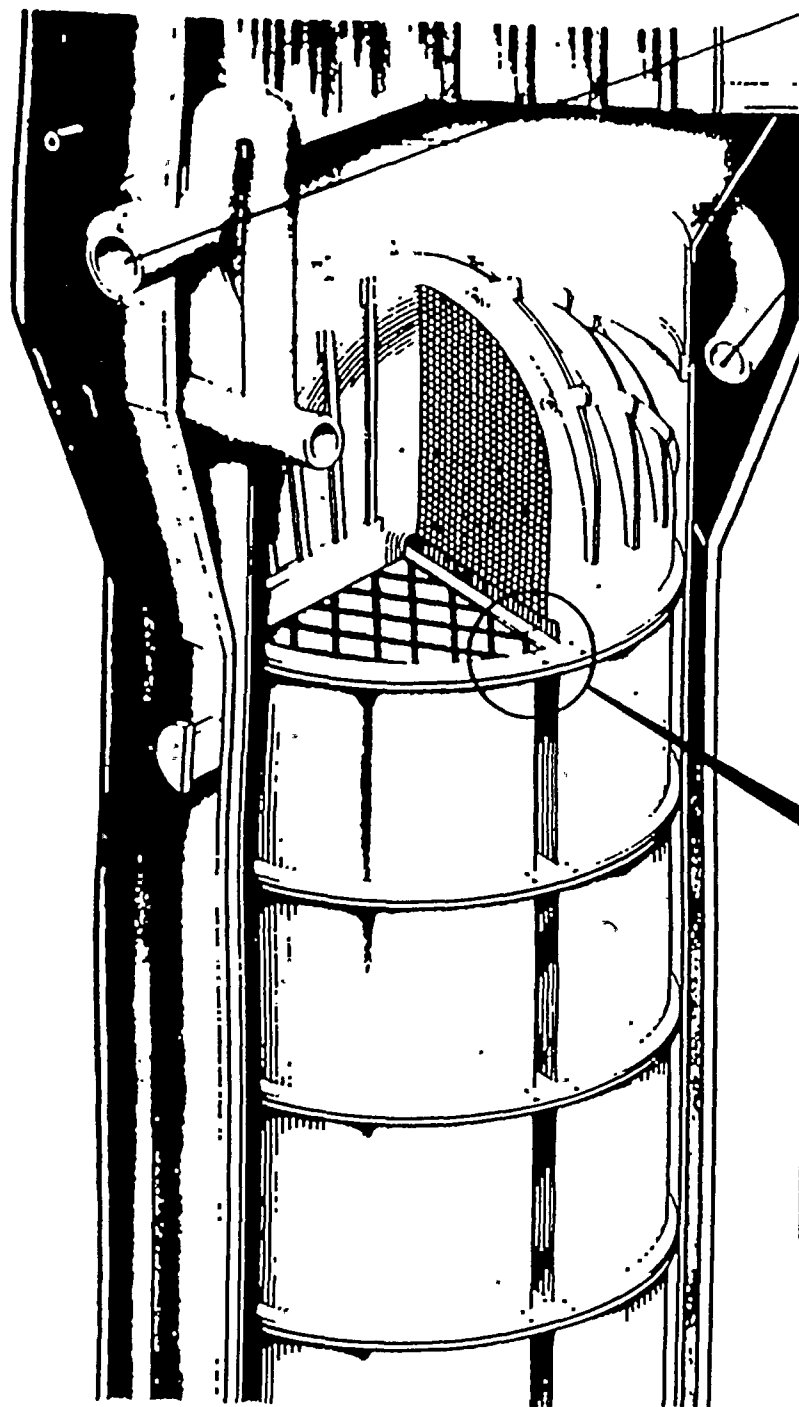
Sergeant said visitors asked serious questions. "They really want to know what we're doing, what the machines are for and how they work," she said. □



Babcock & Wilcox Canada Advanced Series PWR Replacement Steam Generator



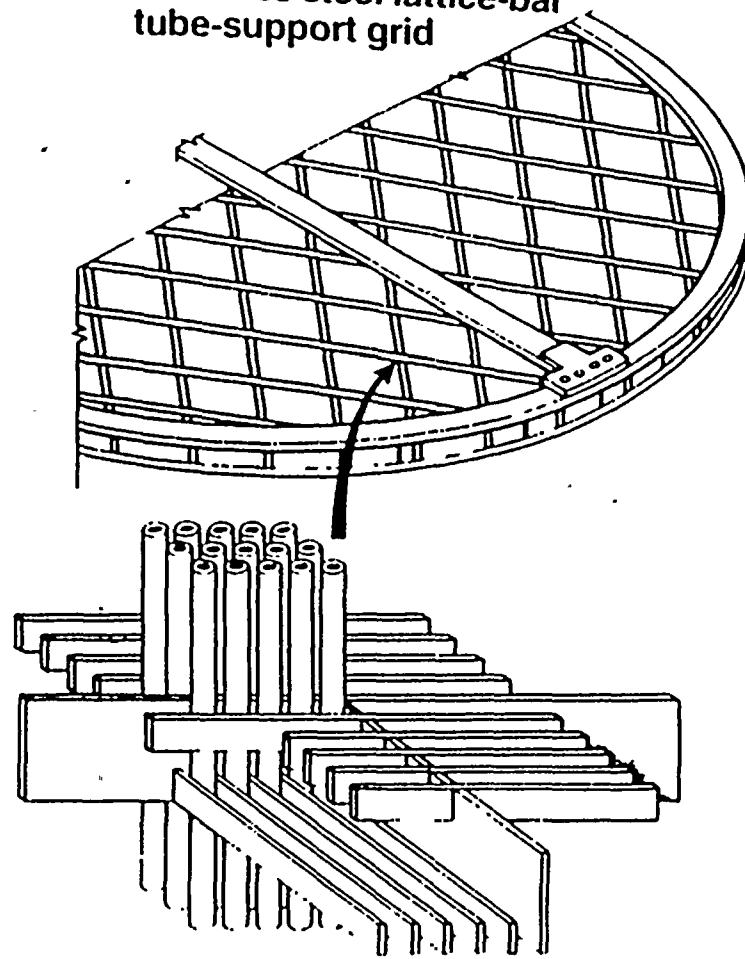




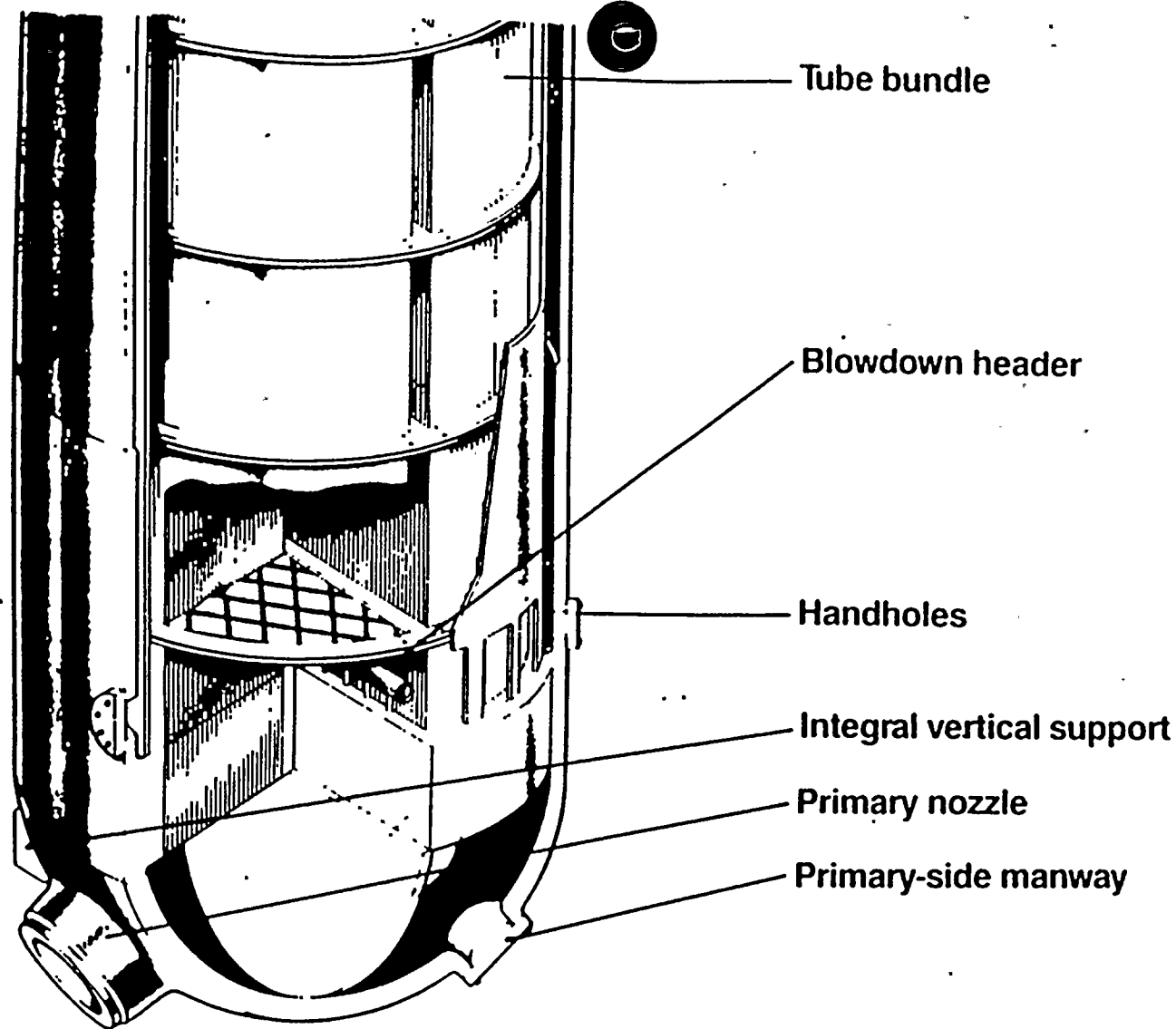
Feedwater inlet

Feedwater header

Stainless steel lattice-bar
tube-support grid







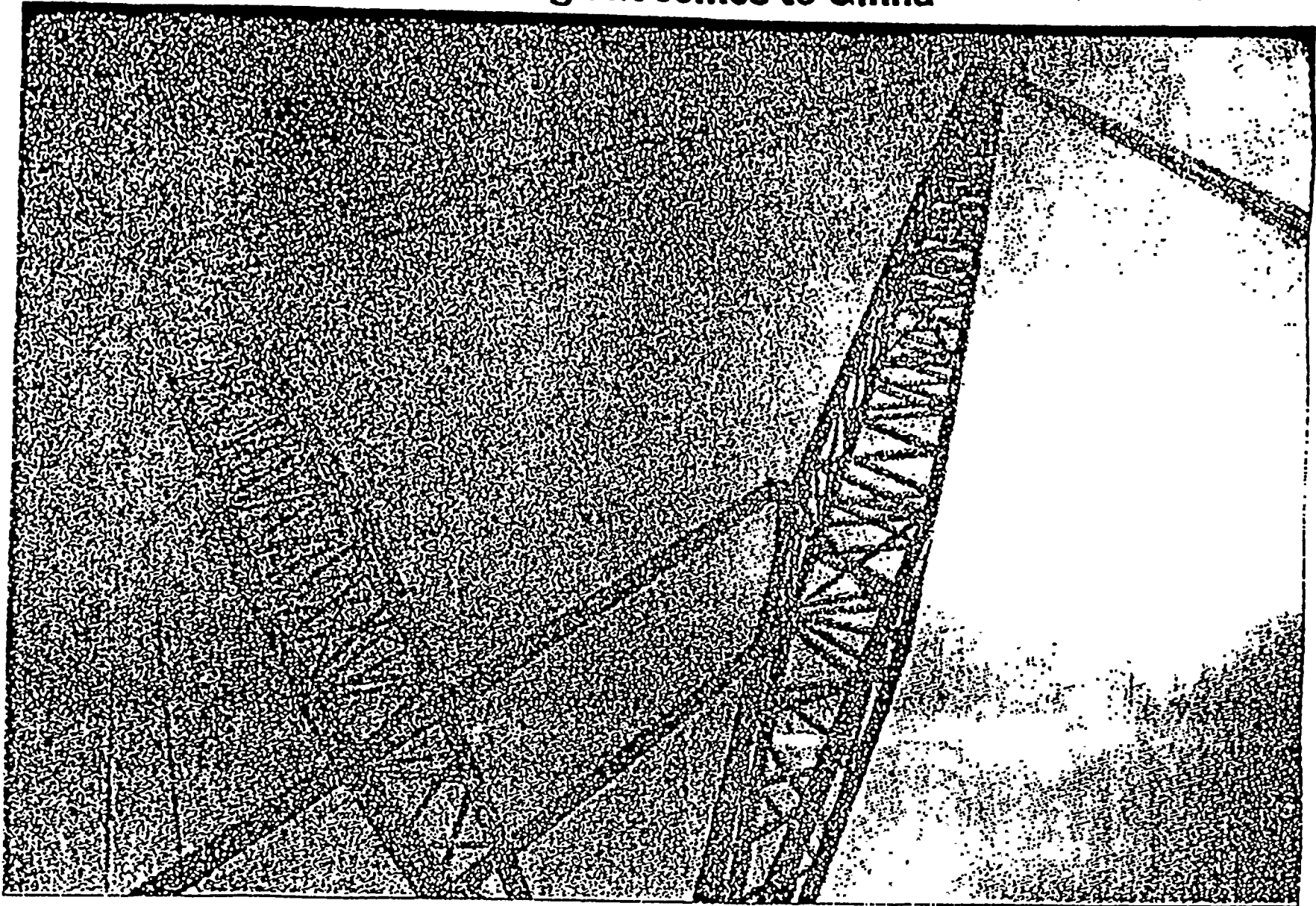
Design Objectives

- Retain all terminal points, outside dimensions and overall performance consistent with existing steam generators and reactor requirements
- Design for maximum reliability in operation
- Achieve high circulation ratios
- Eliminate crevices and potential flow stagnation areas
- Use non-rigid tube supports
- Maintain pressure boundary integrity during seismic and burst pipe events
- Minimize tube residual stress
- Avoid flow-induced vibration
- Assure high steam quality (above 99.75%) under all operating conditions
- Prevent loose parts
- Facilitate inspection and maintenance



Gentle giant comes to Ginna

MARCH 20, 1996



The silhouetted boom of the massive crane to be used in installing the two new steam generators at Ginna nuclear power plant hovers in the sky. Below, Texan Fred Flowers is one of the operators of the machine.



Democrat and Chronicle

Huge crane gets delicate job

It will help install steam generators

MARCH 20, 1996

ONTARIO — You can't miss the temporary addition to the front yard of the Robert E. Ginna nuclear plant along Lake Road in this rural community: the largest mobile crane in the United States.

The sky blue lifting device stands out against the horizon like a towering amusement park ride. On its vertical strut is perched an American flag, jittering in the breeze.

The massive Transi-Lift system crane — high as a football field is long — is hardly suggestive of the delicacy of the work it can do.

Rated to lift 1,200 tons, it can maneuver house-size loads to target points with just thousandths of an inch to spare.

Starting next month, it will be used to lift out two aging steam generators at the 25-year-old facility and replace them with new ones, worth \$20 million each.

The whole project, scheduled to run 61 days starting April 1, will cost Rochester Gas and Electric Corp. \$115 million. Officials there say the refurbishing — the most expensive and controversial Ginna project ever — ensures the life of the 470-megawatt plant until the year 2009, when its license expires.

Texan Fred Flowers will be one of the hoist operators at the controls of the skyscraping lifting machine.

At 6-feet-5-inches, Flowers scrapes a little sky himself.

A rugged grandfather and six-year



Army veteran, Flowers favors checkered wool shirts, a hard hat with an American flag on it and a gold hoop dangling from his left ear. After 44 years in the construction business, he has a handshake like a pair of bolt cutters.

And he's proud of this rig. The Lampson rig is "no comparison" to conventional cranes, says Flowers, a construction veteran who ran his first bulldozer at age 17.

He's been assembling and running configurations of the \$10 million, 2,600-ton Neil F. Lampson mobile lifter for 11 years.

"This crane is so far superior to what we've ever had," he says. "It's like comparing peanuts and apples."

During the seven days in April the giant crane is likely to be in operation, Flowers will crew the 12-hour day shift with three other operators, all from Rochester Operating Engineers Local No. 832: one each in a driver's compartment in the treaded crawlers, front and back; and one worker positioned above the front crawler.

A second Lampson hoist operator will work a 12-hour night shift, also with three local workers.

Each generator lift will take from eight to 12 hours.

Why so long? Components lifted out of the containment dome will have to be "smeared" (checked) for evidence of radiological contamination. Winds will have to stay in the range of 5 to 10 miles per hour. And the loads will move up and down only at a tortoise-like average "hook speed" of about 20 inches a minute.

During a lift, from inside a 6-foot wide cabin perched on the crane's horizontal "stinger" section, Flowers will artfully play his hands over a series of pencil-size levers on a split console. They control the air-driven throttles, transmissions and friction levers that raise and lower the boom and its hanging load.

The 2,600-ton device, anchored by two tank-like carriers, was assembled over five weeks from 120 truckloads of parts.

The giant machine is one of three same-size cranes, the largest in the United States. The Lampson family of adjustable crane systems, founded in 1979, includes about 30 machines scattered over the globe.

Some stationary cranes can lift more — up to 6,000 tons — but Lampson cranes can be assembled away from work areas, then trundled into position when it's time for a lift.

Some stationary cranes can lift more — up to 6,000 tons — but Lampson cranes can be assembled away from work areas, then trundled into position when it's time for a lift.

The major cautions during any lift are wind speed — it can't be too high — and the strength of the foundations the crane rests on during the actual lift, says Allen Watts, an 18-year Lampson veteran and a native of Newport, Wash.

The two foundations sunk for the job will do, he adds: Both are 3 feet deep or more and measure 4,000 square feet and 2,496 square feet respectively.

"There have been mishaps" with Lampson cranes in the last 17 years, says Watts. "I'm not going to candy-coat that."

Accidents in the past — at least three — were caused by the collapse of soils or roads under the crane.

At Edwards Air Force base in 1990, timbers failed in a conduit running under a road beneath a crane carrying a Titan 4 rocket motor loaded with 270,000 pounds of solid fuel.

The crane tipped, the boom fell, and the rocket slid downhill, where it exploded, killing one worker.

But a load has never been dropped during a lift, says Watts, and Transi-Lift cranes have never suffered a structural failure.



The Lampson crane was built by the 50-year-old Lampson company in Washington state. But it looks like something an affable Texas giant like Flowers would run. Everything is big.

■ The crane can lift up to 1,200 tons, about the equivalent of 500 full-size Ford pickups.

■ It weighs 2,600 tons, including counterweights.

■ It can burn 300 gallons of fuel in an eight-hour shift.

■ It has six engines, one for each track and hoist.

■ It has five spools of cable anchored to its stinger. Each can unwind 15 tons and 1.25 miles of steel cable that is as thick as knock-wurst.

■ When each generator is hoisted in or out, the crane's front crawler will be pressed down with a "reaction force" of 4,700 tons of pressure.

Richard L. Miller, project manager for Ginna's chief contractor, Bechtel Power Corp., watched the midwinter assembly process. He calls the Lampson crane system "an erector set."

Not just big numbers get your attention when looking at the mobile crane. Small numbers grab you:

■ One-half mile per hour, the Transi-Lift's top speed. Sometime after a test lift this week — 445 tons, or 125 percent of the anticipated generator lift — it will inch over towards the containment dome.

■ 1/32nd of an inch. That's how close the boom tip can be swung to a target point.

■ Thousandths of an inch, the tolerances by which the crane can vertically line up its load.

Everything on the Lampson Transi-Lift system is very big, very small, very accurate or — above all — very slow.

"Heavy rigging is like watching the grass grow," says Watts.

Armed with a hard-line phone and a handheld radio during the lifts, Watts will direct the operation of the crane from the top of the containment dome.

Watts says handling a crane that large with loads in the hundreds of tons is a delicate business. "I'd rather be flagging (directing) it than running it," he says. "It's like handling a hot kettle on a stove."

But he and Flowers have felt the heat before. In the past decade, they have traveled all over the world to do heavy lifting. They have piled up thousands of lifts, some of them in the range of 1,000-plus tons — three times the size of the Ginna lifts.

They have traveled to South Korea, Great Britain, Norway, Canada, the Virgin Islands and South America.

"If you work with him," says Flowers, shrugging in the direction of his friend Watts, "you're going to have sand in your shoes. It's a lot of traveling."

At one stretch, during a series of jobs in Venezuela, Watts and Flowers were on the road for seven years.

Lampson operators have lifted "all kinds of odd things," says Watts.

They have hoisted up nuclear reactors, icebreakers, building foundations, giant transformers, rocket motors, tugboats, turbines and 200-ton windmill blades. Late last year, they plucked eight barges out of the Mississippi River to be fitted with casinos.

"You can do anything with this crane. Anything it can pick up, it can walk with," says Watts.

He's only been afraid during one lifting operation in his life, he claims — when he hoisted his first-born child. "I almost dropped that one."



Flowers and Watts have done heavy lifting in all kinds of conditions. One job involved moving reactors in Duluth, Minn. — four of them 800 tons each. It unfolded in temperatures of 40 below zero. In Venezuela, the thermometer rose to 105 degrees, with high humidity to match.

And while the crane was parked and idle at a Scotland site, it was slammed with seaside winds that whipped up over 100 miles per hour.

In Wayne County, the Ginna job calls for winds in the range of 5 to 15 miles per hour, though the project is "charted" for winds up to 35 mph. As a precaution, each load — about 350 tons — will be anchored with three guy wires.

"We don't use the word 'drop' around here," says Watts, who talks easily of topping lifts, booms, masts and backhitches. "We take our job very, very seriously."

He will admit that the Ginna generators, at \$20 million each, are worth about 10 times more than the average load Lampson has lifted since the "old days," when nuclear plants were being built.

Lifting the generators has been choreographed step by step, outlined on a wall-size chart blocked out with what look like dance steps. During this week's test lift, the exact "load cells" — counterweight position and weights — for the generator lifts will be laid out and calibrated.

The old generators — capped and swaddled in heavy plastic for storage — will be eased one at a time through holes drilled into the containment dome, lowered vertically, then tilted onto a waiting trailer fitted with a customized support fixture. They'll be trucked to a newly built on-site storage structure and housed behind concrete walls 3-foot thick.

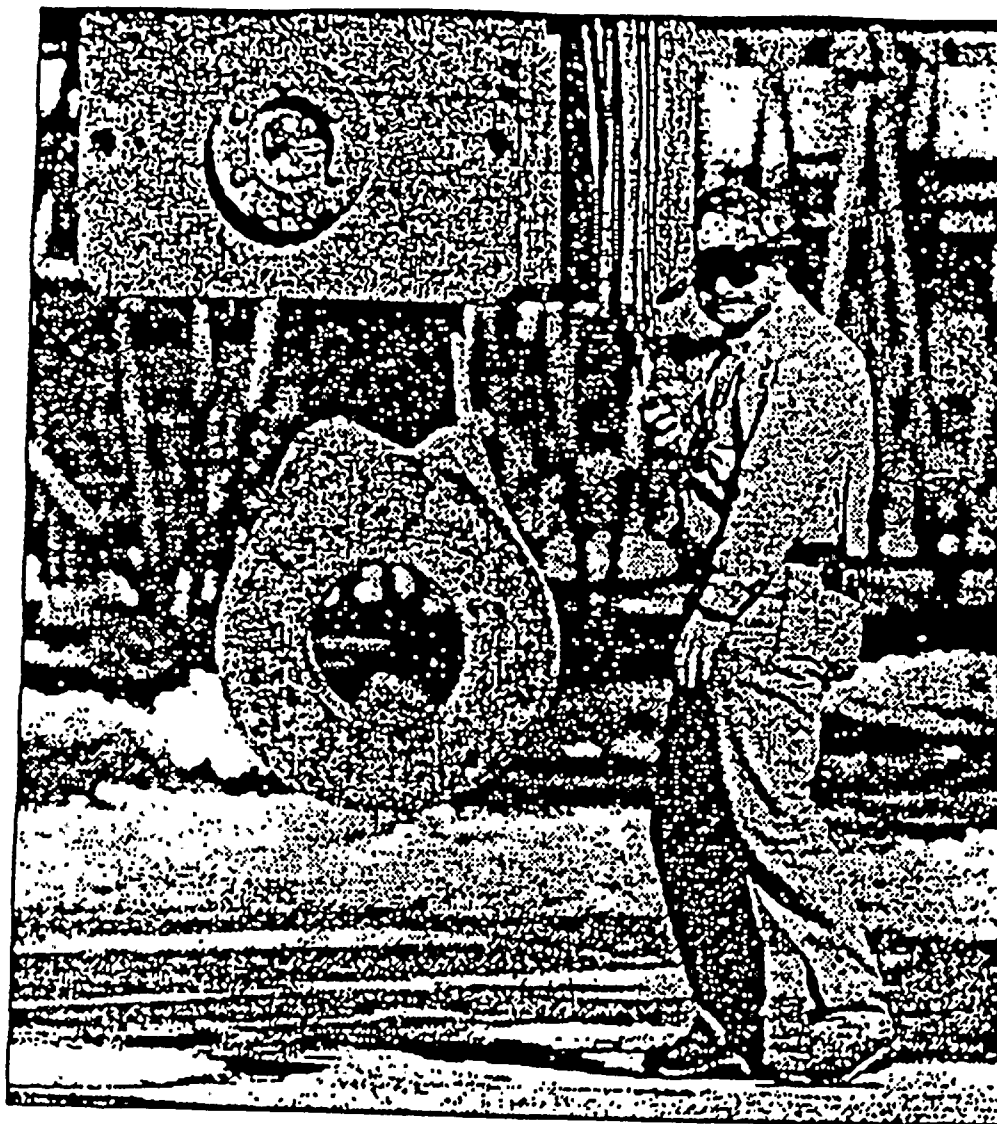
The new generators will be lifted in and each matched with six "mating surfaces," including two nozzles and four support feet. □



MARCH 20, 1996

'This crane is so far superior'

Gentle giant comes to Ginna



In charge Allen Watts, crane supervisor, holds the "load block," which will be attached to the steam generators at Ginna plant.

About the Transi-Lift

■ The Transi-Lift arrived at Ginna on more than 100 tractor-trucks over a one-month period.

■ It took five weeks and two other cranes to assemble the Transi-Lift.

■ The crane is valued at \$10 million.

■ The boom will be lowered to a 43-degree angle for the lift. To accommodate that angle, the crane will be sitting 250 feet from the containment building.

■ The crane will lift the generators at a rate of about 20 inches per minute.

Lampson Transi-Lift crane systems have been in operation since 1979. About 30 are scattered around the globe, including privately owned units in Scotland, Norway, Japan and South Korea. "Tens of thousands" of lifts have been made so far, said Lampson crane expert Allen Watts.

Among the lift projects Watts has supervised:

■ **Caron, Venezuela (1993-1994):** 12,000 total tons of refinery equipment, including single lifts of 500 tons.

■ **St. Croix, U.S. Virgin Island (1991-1993):** 55,000 total tons of refinery equipment.

■ **Beaumont, Texas (1991):** Refinery equipment, including single lifts up to 1,000 tons.

■ **Ulsan, South Korea (1985-1986):** At the Hyundai Shipyard multiple-crane lifts of up to 2,000 tons.

■ **Nairn, Scotland (1981-1984):** Single crane lifts of up to 1,650 tons.

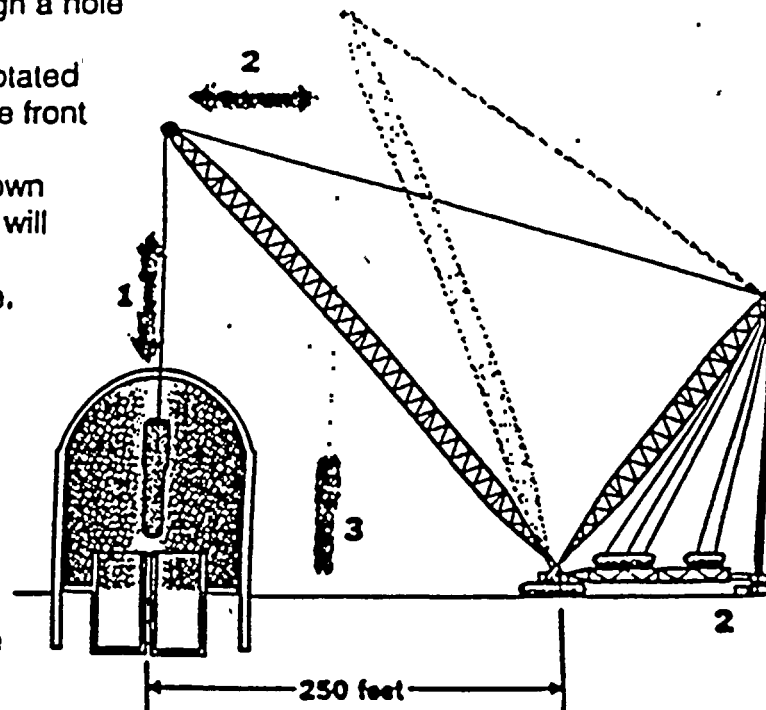


● "This crane is so far superior"

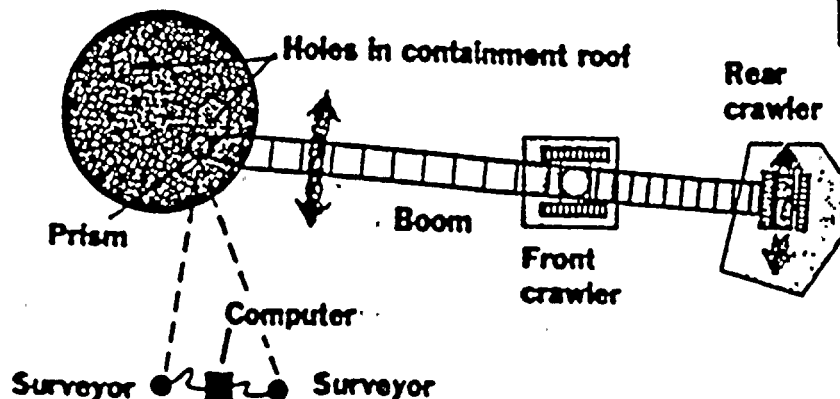
How the crane will lift a generator

1. The generator will be lifted straight up through a hole in the roof.
2. The boom will be raised. The crane will be rotated with the back crawler moving in an arc while the front crawler remains stationary.
3. The old generator will be lowered straight down into a cradle on the ground. The same process will be repeated for the second generator and then reversed to put the two new generators in place.

Mobility: The crawlers can pivot 360 degrees beneath the crane or move in unison in any direction. The crawlers sit on 3- to 4-foot thick concrete platforms to eliminate the possibility of an accident caused by unstable ground.



Bird's-eye view of crane, containment dome

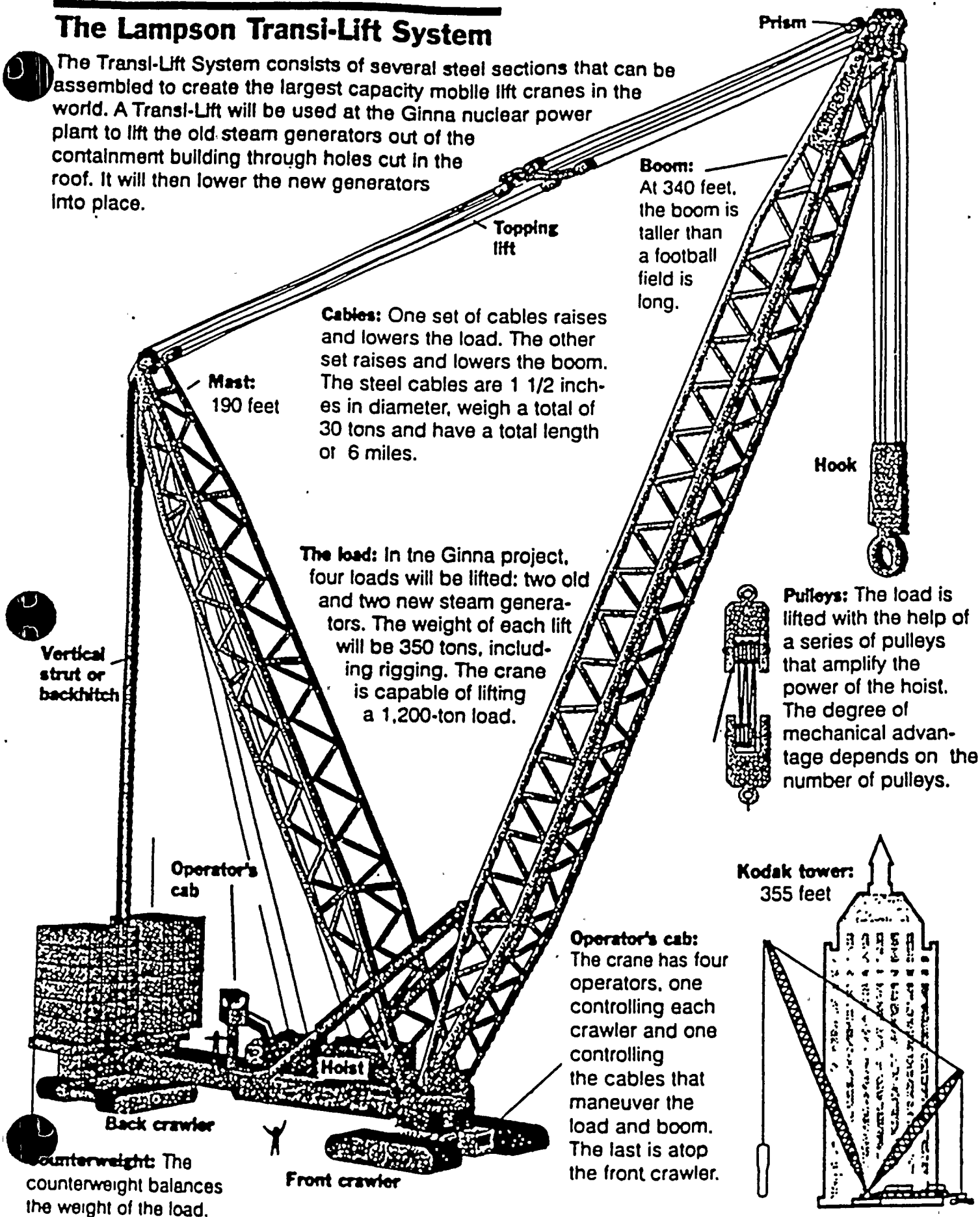


A computerized surveying system will be used to spot the boom of the crane directly over the center of each steam generator.

MARCH 20, 1996

The Lampson Transi-Lift System

The Transi-Lift System consists of several steel sections that can be assembled to create the largest capacity mobile lift cranes in the world. A Transi-Lift will be used at the Ginna nuclear power plant to lift the old steam generators out of the containment building through holes cut in the roof. It will then lower the new generators into place.





Democrat and Chronicle

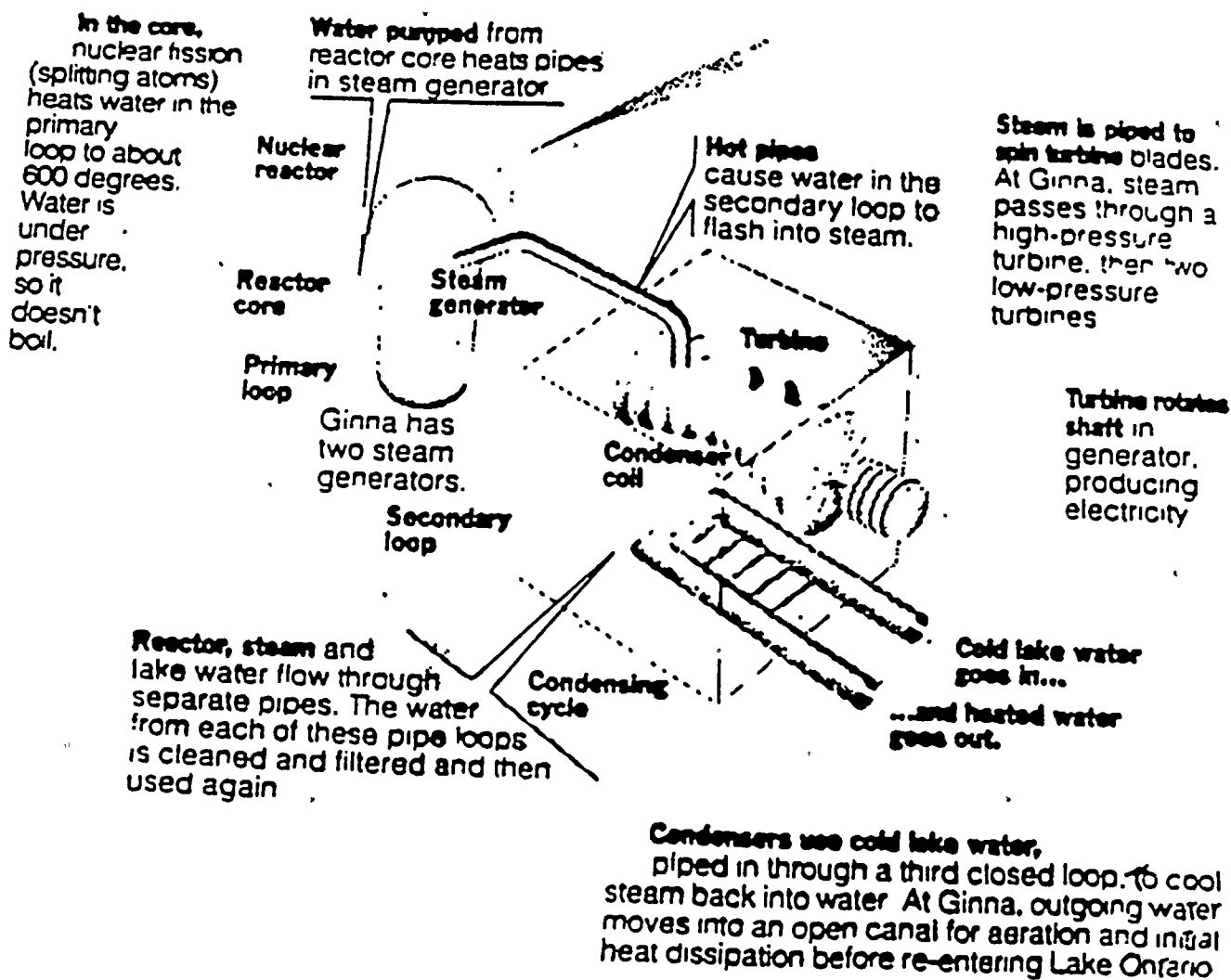
ONTARIO/WAYNE METRO EDITION

MARCH 31, 1996

\$1.50 NEWS

How Ginna nuclear power plant works

A nuclear power plant works just like a coal or gas plant: All make steam to produce power. At a nuclear plant, uranium is the fuel used to heat water in the reactor to make steam. The steam spins the blades of a turbine that in turn generates electricity.





THE GINNA PROJECT STEP BY STEP

How the steam generators will be replaced

Plant shutdown

1 Control rods are inserted between fuel assemblies (square bundles of fuel rods) in the reactor core. Starting at 12.01 a.m. tomorrow

2 Boron is added to water entering the reactor core via the cooling system.

About 7 a.m. tomorrow, cooling reaches a level where steam pressure sufficient to push energy out of the plant can no longer be sustained. The plant goes "off grid." The electrical generator disconnects from the lines that carry power from the plant. The plant is now shut down.

3 Defueling begins on Saturday. The reactor vessel is flooded with water and the cap lifted off

4 Gates are opened between the vessel and the refueling canal, which is also filled with water. The canal leads to the spent fuel pool

5 Fuel assemblies are lifted from the reactor by an overhead crane and set down horizontally on a cart in the canal. The cart is moved on tracks through a transfer canal in the central building wall.

6 Fuel assemblies are lifted off the cart and set down in an upright position in slots of a rack on the bottom of the 40-foot-deep pool.

Replacing the generators

On Wednesday, workers begin to chip away at the concrete of the containment dome. About April 14, with all the fuel removed from the building, the stainless steel liner of the dome will be perforated to complete holes for lifting out the generators

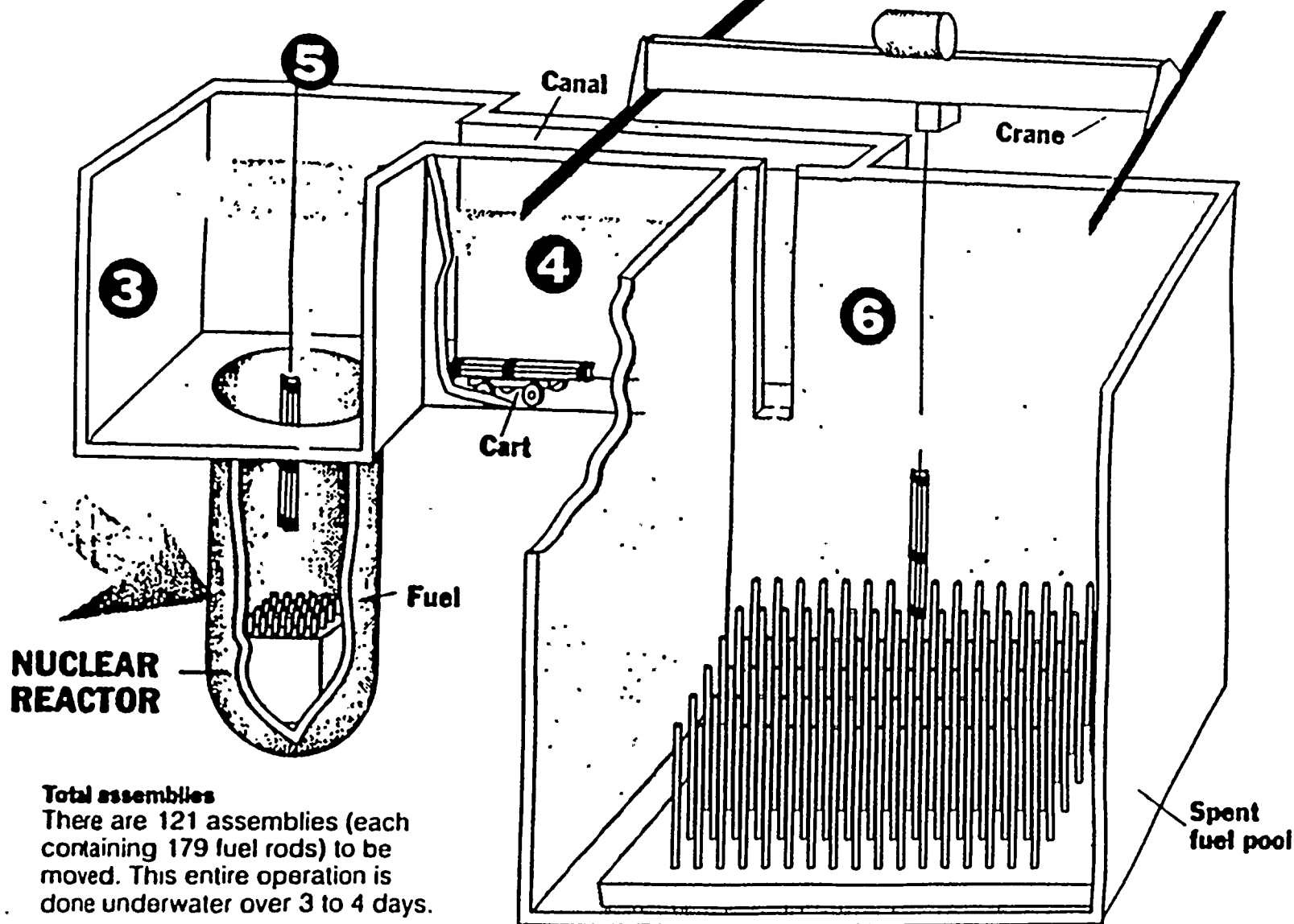
7 The generators will be wrapped in protective material to contain contamination. Workers will cut away the pipes attached to the old steam generators

8 About April 17, the first steam generator will be lifted through the roof of the containment building by a 340-foot tall crane. It will be set down on a specially constructed trailer on the ground.

9 The old generator will be trucked to a nearby storage building that has 3-foot thick concrete walls



THE GINNA PROJECT STEP BY STEP



Total assemblies

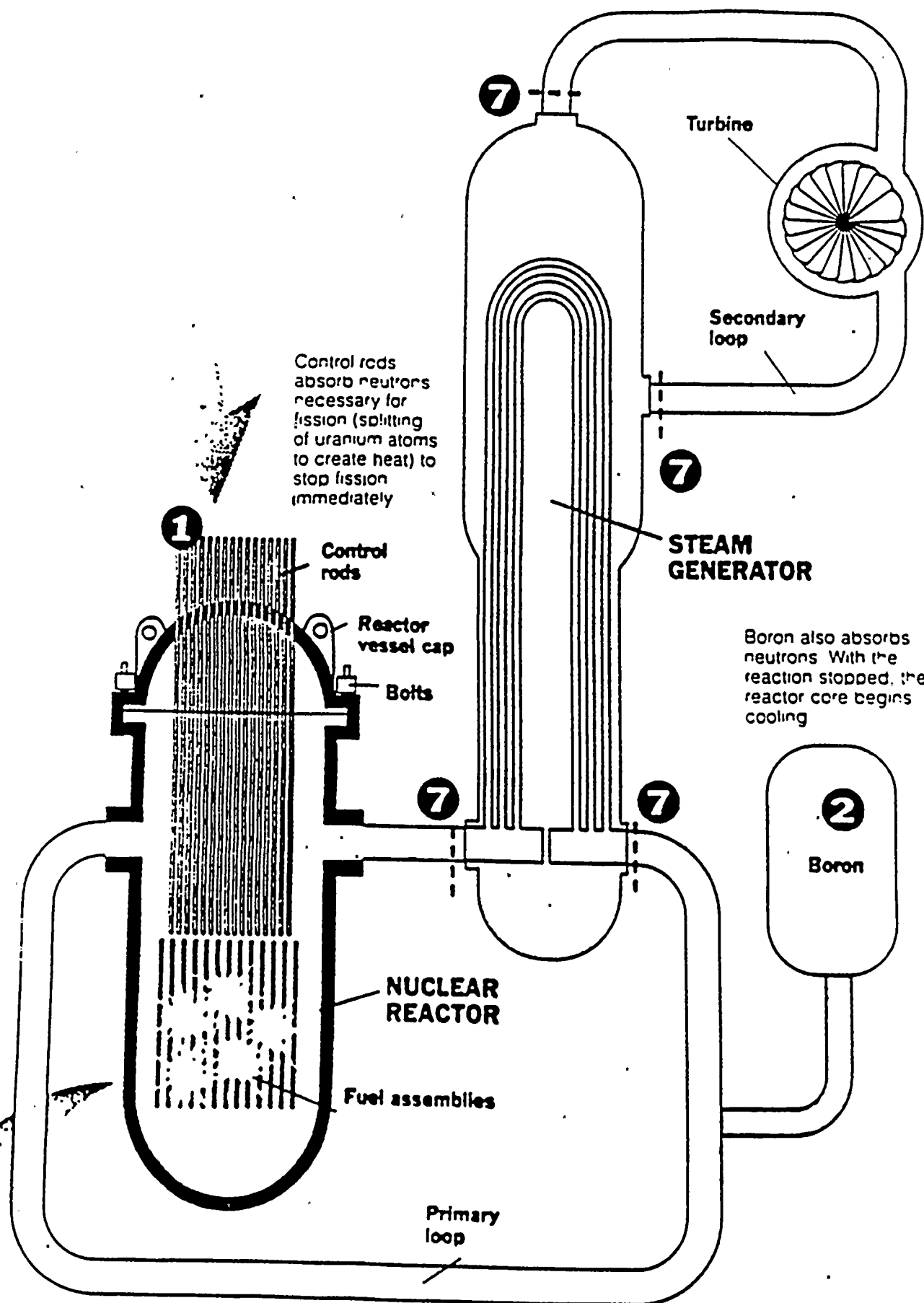
There are 121 assemblies (each containing 179 fuel rods) to be moved. This entire operation is done underwater over 3 to 4 days.

Spent fuel pool

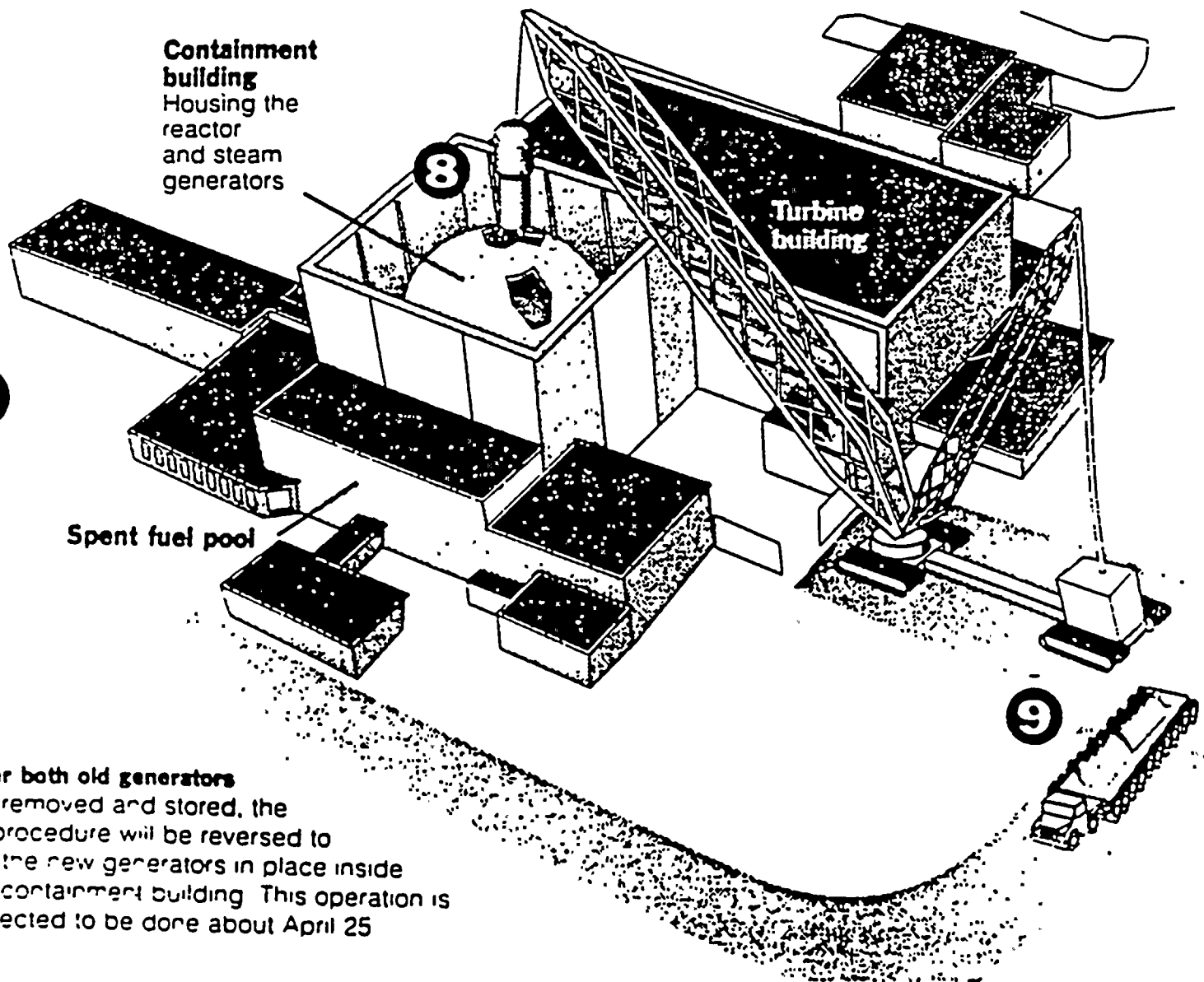
When the generators have been replaced, the refueling process is reversed. Eighty-one old fuel assemblies will be returned to the reactor along with 40 new assemblies. Fuel no longer in use



THE GINNA PROJECT STEP BY STEP



THE GINNA PROJECT STEP BY STEP



After both old generators are removed and stored, the procedure will be reversed to put the new generators in place inside the containment building. This operation is expected to be done about April 25.

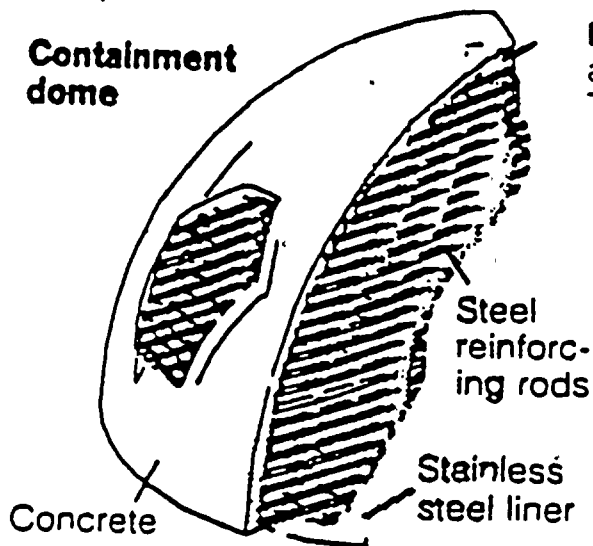


THE GINNA PROJECT STEP BY STEP

Follow-up and testing

When the new generators are securely in place, tests will be run to check for safety and performance.

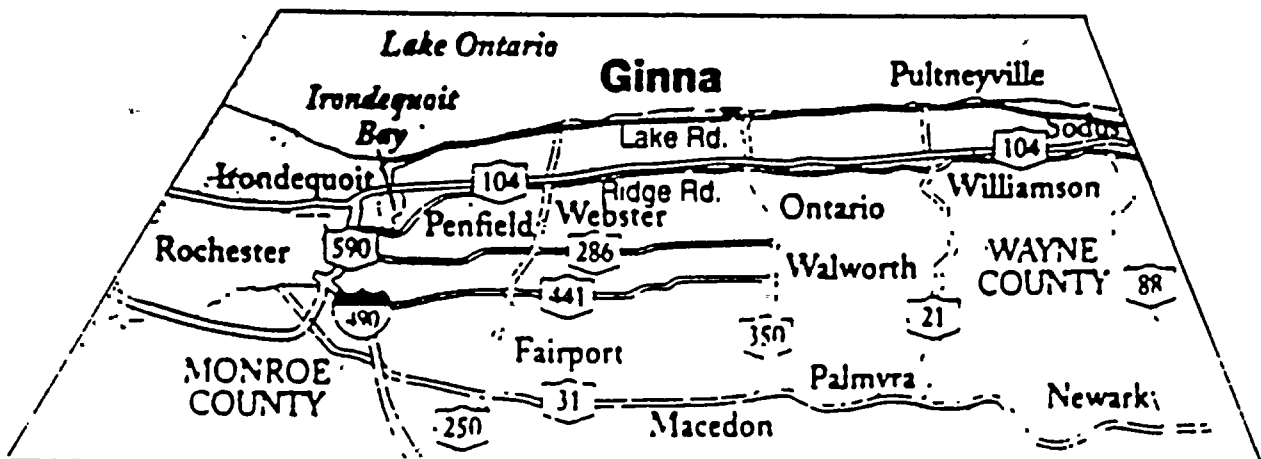
Containment dome



Holes in the dome will be repaired. Steel plates and reinforcing rods will be welded into place. Thirty inches of new concrete will be poured.

To test the patches, the containment building will be "pumped up" with air at a pressure of 72 pounds per square inch, 12 pounds over design capacity.

In June, with the approval of the Nuclear Regulatory Commission, the plant will become operational again.



Democrat and Chronicle

ONTARIO/WAYNE METRO EDITION

SUNDAY, MARCH 31, 1996

\$1.50 NEWSSTAND

Questions still linger as nuclear plant shuts down to install new generators

By JANET LIVELY
STAFF WRITER

ONTARIO -- The Ginna nuclear power plant shuts down at midnight tonight for the biggest repair job of its 26-year history.

During the next six weeks, the two old steam generators at the Ontario, Wayne County, plant will be removed through a hole in the containment dome and replaced. The construction technique has never been tried before.

At \$115 million, the job costs more than the original \$88 million price of building the plant and is the biggest single capital expense for Rochester Gas and Electric Corp. since it became a part owner of the Nine Mile Two nuclear power plant in Oswego County in the 1980s.

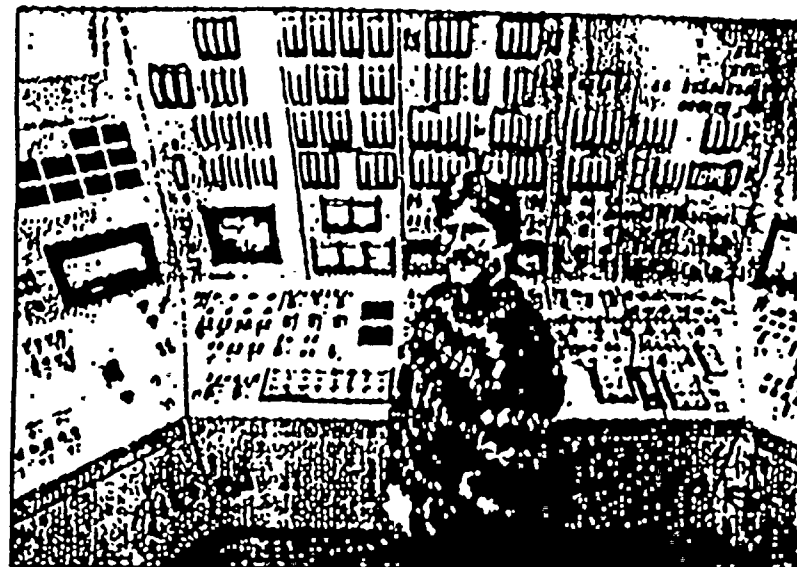
But even as the long planned project enters its final stage,

questions remain about whether RG&E made the right call. RG&E says the new steam generators will pay for themselves by increasing plant efficiency and lowering maintenance costs. If the company is wrong, customers or shareholders will foot the bill.

Is project worth it?

Critics say replacing the steam generators is like putting a new transmission in a 15-year-old car. Considering all the other parts that can fail at an aging nuclear plant, it's just not worth the money, they maintain. Ginna is the nation's sixth-oldest operating reactor.

But company officials say the replacement will allow shareholders and ratepayers to get their money's worth out of the huge investment already made in the plant. Since 1970, RG&E has performed \$434 million worth of



Control room Ron Fellows, head control operator at Ginna, will be shutting down the reactor when the plant goes off-line for scheduled maintenance and steam generator replacement work.

improvements and maintenance at Ginna. It has \$261 million of unrecovered expenses on the books, which won't be fully paid until the expiration of the plant's license in 2009.

Adding \$115 million to Ginna's debt was not taken lightly by company directors, who were ready to pull the plug at any time

QUESTIONS, PAGE 13A

INSIDE

■ **Inside Ginna:** A graphic takes you step by step through the project. 12A

■ **A first:** Construction method unique in industry. 13A

■ **Regulators:** Public Service Commission oversees spending by RG&E. 13A



One man not convinced

When it finally does come time to ante up, RG&E says the new steam generators won't be a liability to either shareholders or ratepayers because they will be well on the way to paying for themselves. But the company hasn't convinced Charles Straka, a retired Xerox Corp. financial analyst who is participating in the RG&E rate case.

"They assumed too many favorable benefits," said Straka, a Fairport resident. "If any one of those or a combination does not happen, it's not a prudent thing."

For example, the company assumes that the market price of power will go up faster than Ginna's costs. But market prices could stay lower than RG&E thinks in a competitive environment, he said.

The company also assumes that the rest of the plant will remain in good enough condition to go 18 months between shutting down for refueling and repairs. If the plant is turned off more often, the savings attributed to the new steam generators start to shrink, Straka said.

RG&E says it anticipates no further major repairs at Ginna. A potential crisis was averted last week with the NRC's formal resolution of questions about the safety of the plant's reactor vessel.

Analysis of new data from RG&E convinced regulators that the vessel is safe to operate through 2009. The decision is subject to change if new data becomes available, but company officials say the NRC is unlikely to alter its position.

Yet more problems will crop up as Ginna and other nuclear plants near the end of their license periods, says Paul Gunter, with the Reactor Watchdog Project in Washington, D.C. New steam generators will buy RG&E some time, but they don't guarantee that it can keep the plant running until 2009, he said.

But Strosnider insists that NRC engineers are monitoring aging problems and will require operators to make any repairs necessary to keep the plants running safely □

What is the PSC?

The state Public Service Commission will ultimately decide who will pay for Ginna repairs. It has five members who are appointed by the governor to six-year terms. They oversee the regulation of electric and gas utilities and private water companies, and have limited



O'Mara

authority over cable companies.

The appointed commissioners rule on companies' rates, set service standards and resolve other industry issues.

However, they depend on the Department of Public Service to review the issues that come before them. Department employees are expected to act as advocates for customers.

PSC Chairman John O'Mara of Horseheads, Chemung County, was appointed in December by Gov. George Pataki. O'Mara, a former judge and district attorney, ran upstate operations for Pataki's 1994 campaign.

Why you should care

Rochester Gas and Electric Corp. is the main provider of electricity and gas for more than 500,000 residences in the Greater Rochester area. The average residential bill annually is \$1,896 for both gas and electric.

The company has faced scrutiny over this project from the Nuclear Regulatory Commission and some citizens' groups, and will face further scrutiny by the state Public Service Commission. The company also faced two major controversies in the past five years, over its handling of the 1991 ice storm — in which thousands of people lost power — and a January 1995 controversy over heating bills, which soared because the company bought too much pipeline capacity.

Common in industry

Replacing the steam generators will allow the plant to shut down for refueling and repairs every 18 months instead of once a year, saving money on replacement power and other costs, the company said. It also boosts electricity production to full capacity.

The replacement option is common in the industry. Nine U.S. nuclear operators already have installed new steam generators at 12 plants and at least another six are contemplating replacement, according to the Nuclear Energy Institute.

However, Portland General Electric Co. decided in 1993 that it was cheaper to close its Trojan nuclear plant than to replace its steam generators, even though the plant had operated for only 16 years and had \$288 million in outstanding debt.

Closing Ginna would not be a good deal for customers or shareholders in part because Ginna has a better operating record than Trojan, Mecredy said. The company's analysis looked at closing Ginna and buying all the necessary power from other utilities in the Northeast and Canada, which have excess generation capacity.

This power glut has created a buyer's market. The going price on the New York Power Pool is 2.5 cents per kilowatt hour, plus transmission charges.

By comparison, it costs RG&E 4.5 cents per kilowatt hour to make electricity at Ginna, including operating expenses and long-term recovery of capital improvements.

But while Ginna's costs are above the market price now, RG&E predicts that this discrepancy will not last. Market prices will rise as the power surplus subsides, while Ginna costs will remain stable. By 2004, it will be cheaper to make power at Ginna than to buy it, the company says.

Wall Street, however, is not as optimistic. Analysts worry that nuclear power will be noncompetitive under deregulation. Nuclear power plants, Ginna included, are considered a liability because they can't pay their bills at the current market price.

Figuring out how to close this gap is the thorniest question facing regulators and lawmakers as they ponder how to deregulate the electric industry. They need to determine whether to get the money from stockholders, ratepayers or both.

Questions lingering at Ginna as repairs begin

during the three-year planning period, said Cornelius J. Murphy, a retired Kodak executive and a RG&E board member since 1981.



Mocredy

However, repeated analyses showed "the business case was strong" for spending the money to keep Ginna running efficiently, Murphy said.

RG&E won't release dollar figures showing how the expected benefits compare to project costs. That information must stay secret because it could be used by competitors, said William J. Reddy, RG&E group manager of public affairs.

Other options weighed

However, RG&E does say that its other options were more expensive. Fixing the old steam generators would cost \$50 million more than the replacement job. Shutting down the plant would cost \$100 million more.

Thomas A. D'Ambrosia, a staff auditor with the state Public Service Commission, has seen RG&E's numbers and agrees that they show long-term benefits for the steam generator replacement. But because it takes several years for the benefits to outweigh the costs, D'Ambrosia maintains that customers should get a break in the near term.

RG&E will start charging customers for the project when its new rate year begins in July. Its rate proposal, now being debated before the PSC, includes a net cost of about \$10 million for the new steam generators. The rest of the money will be collected through 2009.

The PSC is allowing RG&E to include the steam generator costs in its rates, even though it retains the right to review the "prudence" of the project at a later time.

If the job ever is found to be imprudent, RG&E would have to eat all or part of the \$115 million. Customers might get refunds and profits could be cut.

Prudence reviews are almost always done retroactively. Regulators assume that companies are doing the right thing and don't challenge decisions unless they have cause to suspect otherwise. The question hasn't been raised about the steam generator project.

That issue aside, the coming deregulation of the electric industry puts a new twist on the collection of the project costs, D'Ambrosia said. The costs of the new steam generators outweigh the savings until 2000, but by then, deregulation could be a reality, he said.

Deregulated companies will be able to make unlimited profits on the electricity they sell. And RG&E predicts it will be able to make money on Ginna power by 2004 — after it already has collected much of the cost of the steam generators from customers.

"The ratepayers' loss today, in effect, results in increase shareholder profit tomorrow," D'Ambrosia said.

His proposal: RG&E should defer collection of \$2.4 million of Ginna costs in 1996 and each subsequent year until deregulation. He figures that would reduce the potential "ratepayer subsidy" by 25 percent.



Balancing the costs

But RG&E argues that just because the project will be a net loss for the following few years doesn't mean that it isn't worthwhile long term. The company rejects D'Ambrosia's proposal and maintains that it should be allowed to recover its full costs until and unless the project is declared imprudent.

The risk of that happening is small, assures Reddy. RG&E's other options were too expensive, he said.

Repairing the existing generators would avoid the large one-time expense, but annual repair costs would add up. The company would have spent \$13.1 million on steam generator maintenance this year alone if not for the replacement project, said Robert C. Mecredy, RG&E vice president of nuclear operations.

Most of the repairs would involve the 3,260 tubes inside each of the 63-foot-tall steam generators. Ginna and other "pressure-water" nuclear reactor plants in the United States have been plagued by tube degradation.

Super-heated water from the reactor core is pumped through the tubes, each about the diameter of a garden hose. Water from a separate system is pumped into the steam generators where heat from the tubes boils it into steam. The steam powers the turbine that produces electricity.

Radiation from the reactor water, corrosion from the "steam" water, high heat and vibration have taken a toll over the years. Heavily damaged tubes are at risk of rupturing, which would allow radioactive water inside the tube to mix with the steam. Radioactive steam could be vented into the atmosphere.

The Nuclear Regulatory Commission requires regular inspections and monitoring of the tubes to identify deterioration before rupture is a risk, said Jack Strosnider, the NRC's chief of the materials and chemical engineer branch. Damaged tubes must be plugged or repaired.

Because of the NRC's requirements, Ginna could have safely operated its old steam generators until 2009, Strosnider said. But repairs and monitoring are costly and tube plugging can reduce efficiency.

Plugged tubes and other problems with Ginna's steam generators already have cut the electricity production to 96 percent of capacity, Mecredy said.

The company's analysis assumed the damage would not force the plant to shut down before 2009. But considering tube problems discovered recently at other plants, it's possible that the old steam generators wouldn't have made it that long, Mecredy said.

In the meantime, the company would have to shut down more frequently and for longer periods to make the necessary repairs. Because Ginna fulfills half the power requirements of RG&E customers, the company must spend thousands on purchased power when the plant is not operating. It will spend about \$130,000 a day during this outage.

Generator project involves unique and routine work

Project split into 3,300 separate tasks

By CORYDON IRELAND
STAFF WRITER

ONTARIO — Shutting down the Ginna nuclear power plant for refueling and repairs is like "driving up to the gas pump," says plant manager Joseph A. Widay.

He might add: "Make that \$115 million worth of regular."

The outage, normally done once a year for far less money, is stretched out this year by a mix of the routine and the rare.

The routine involves replacing 40 of the reactor's 121 fuel rod assemblies, the nuclear bundles used to superheat water.

The rare means replacing two aging steam generators the size of small submarines. They'll be hoisted out of holes drilled into Ginna's 30-inch-thick containment dome and replaced with two new ones, each worth \$20 million.

Worldwide, it will be the first such replacement project to breach the containment dome and remove steam generators whole.

Rochester Gas and Electric Corp. officials, answering a faint chorus of skeptics, insist their unusual approach is safe.

All the nuclear fuel will be removed first; the opened dome will be shielded so little air escapes; and any radiation releases will be too low to measure off site, said Robert C. McCredy, RG&E vice president for nuclear operations.

The project is divided into 3,300 separate tasks, said RG&E outage manager John Cook.

An outline of the project, with approximate times and dates:

■ At 12:01 a.m. tomorrow, cool-down and defueling begin.

■ At 7 a.m., power generation stops, pushing Ginna "off grid." Customers won't be affected.

■ At 9 a.m., workers mount the domed containment vessel to set up drilling equipment.

■ On Tuesday, the reactor core reaches 100 degrees Fahrenheit, down from a working peak of 500 degrees. "Cold shut down" begins.

By Tuesday or Wednesday, the reactor is disassembled. The coolant system is depressurized and vented. The reactor is drained below the collar-like vessel flange. Workers begin to "detension" the reactor cap's 48 studs, each six inches wide. Then they submerge the containment vessel with 300,000 gallons of tank-stored water.

On Wednesday, using cutting torches and a Brokk Swedish hydraulic jackhammer, workers on the containment dome begin removing the first of three layers of concrete and reinforcing steel liner.

The two final holes will be hexagonal and 22 feet wide. One, over generator B, has an added 10-by-26 foot slot, designed to keep lifts away from the spent fuel pool.

■ April 6-10: Fuel removed from reactor. All fuel assemblies are lifted out of the reactor and moved to the spent fuel pool. This operation happens entirely underwater.

■ April 14-19: Steel liners over old generators are removed.

■ April 17-20: Workers use a giant mobile crane to hoist out the old generators, one at a time.

■ April 22-25: They lift in the new generators.

■ April 24-30: New steel liner plates are installed over generators.

■ April 30-May 17: New reinforcing rod and concrete installed.

■ May 13-16: Reactor refueled.

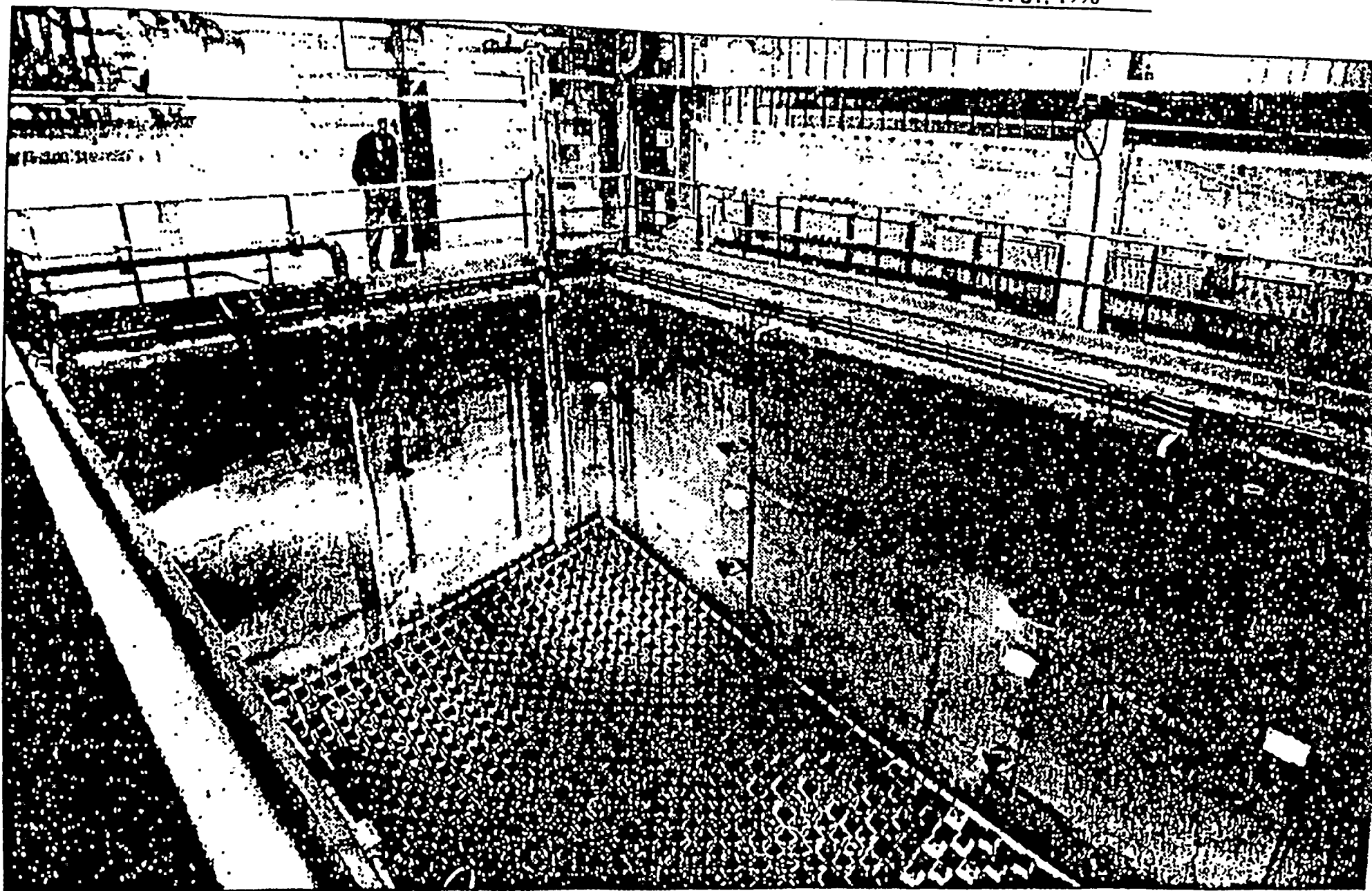
■ May 22-26: Structural integrity of containment vessel tested.

■ May 29-30: Reactor started up and tested.

■ May 31-June 6: Plant goes back on line during this interval, pending approval of the federal Nuclear Regulatory Commission. □

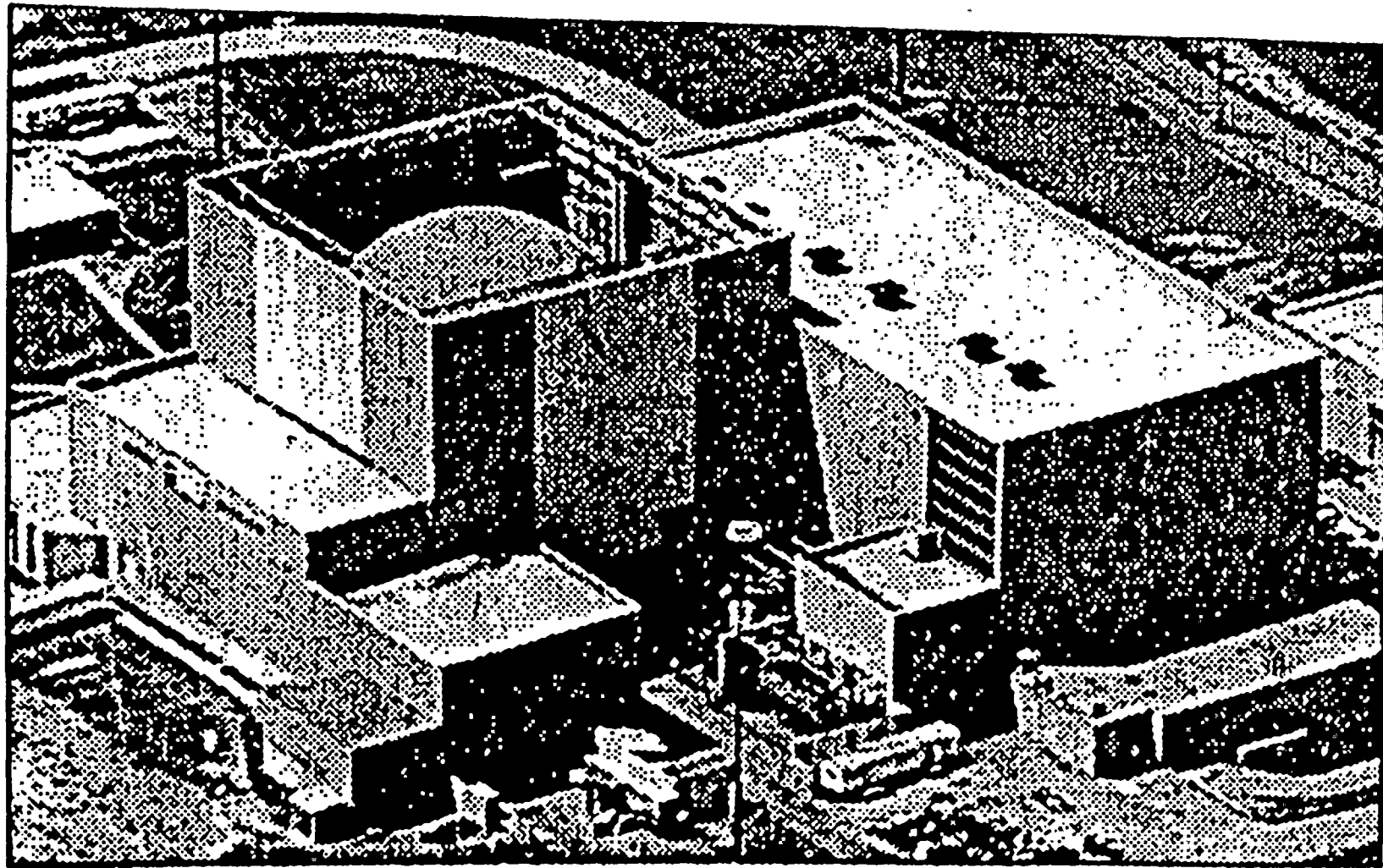


DEMOCRAT AND CHRONICLE, ROCHESTER, N.Y. SUNDAY, MARCH 31, 1996



Spent fuel pool This pit stores used fuel containers in a pool of treated water. The pit has enough space to last until at least 2008.

DEMOCRAT AND CHRONICLE, ROCHESTER, N.Y., SUNDAY, MARCH 31, 1996



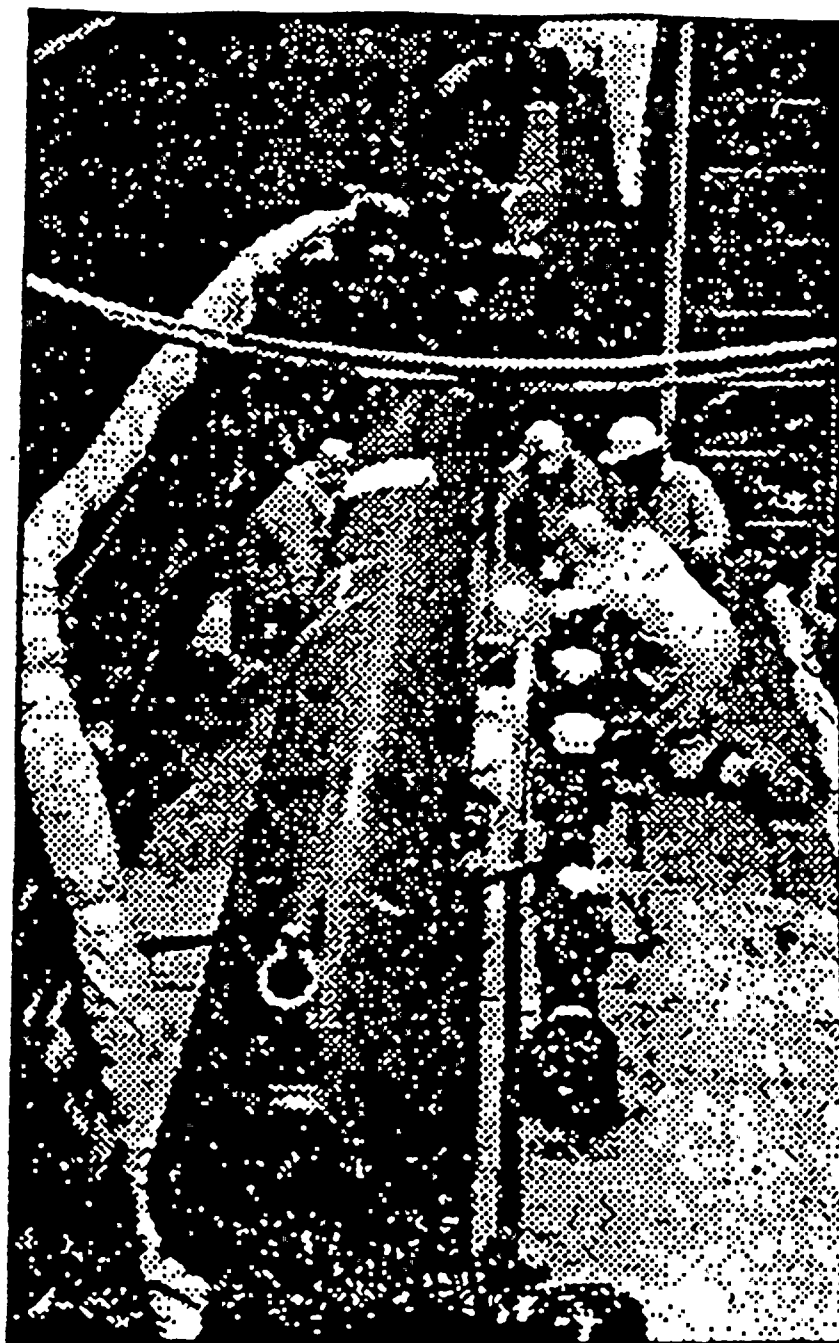
From above An aerial view of the Ginna nuclear power plant. The main reactor building, with the dome containment building, can be seen inside the box-shaped facade surrounding it.





Preparations Ginna plant workers load 55-gallon drums with equipment needed during the steam generator replacement project. The drums will be stored in the containment dome until needed.





Close quarters Workers inside the auxiliary building construct a spent fuel backup cooling system as part of Ginna's steam generator project.



LOCAL/STATE

THURSDAY, APRIL 25, 1996

Democrat and Chronicle

ROCHESTER, NEW YORK

Going, going, and in goes generator

Ginna nuclear plant puts new machinery into place

By CORYDON IRELAND
STAFF WRITER

ONTARIO — With a click, click, click of steel cable and the hum of diesels, a giant crane yesterday lifted the last of two new steam generators into the Ginna nuclear power plant.

The five-hour operation, carried off despite brisk winds off Lake Ontario, wrapped up four dramatic lifts to replace two aging steam generators with new ones.

The new Babcock & Wilcox machines, at 316 tons and \$20 million each, will reduce tube corrosion and boost plant efficiency, said Richard J. Watts, manager of nuclear assessment at Ginna owner Rochester Gas

and Electric Corp.

Forty-five percent of the steam tubes were patched or plugged in the old generators, now stored in a sealed concrete building at Ginna.

"From here on out, it's pretty routine," said RG&E spokesman Mike Power of the 67-day project, set to end in early June.

Next: Two holes in the containment dome used to insert new equipment get patched by mid-May; turbines and back-up diesel generators undergo maintenance; and the reactor gets refueled.

Among 100 onlookers braving chill winds yesterday afternoon at a public viewing area off Ontario Center Road was A.J. Hamby of Mount Morris, Livingston County. He managed the crew of 125 ironworkers who helped build Ginna from 1965 to 1968.

"This is history in the making," said Hamby, peering past hillside apple orchards

to the distant generator. It hung like a toy from a 32-story Lampson crane the size of a roller coaster.

In the past eight days, Hamby drove 62 miles each way to watch all four lifts. He called Ginna "the safest nuclear power plant in the world. There was nothing spared here. There were no shortcuts."

The Ginna project was the first in the world to use holes in the containment dome — a nuclear reactor's protective cover — to replace machinery.

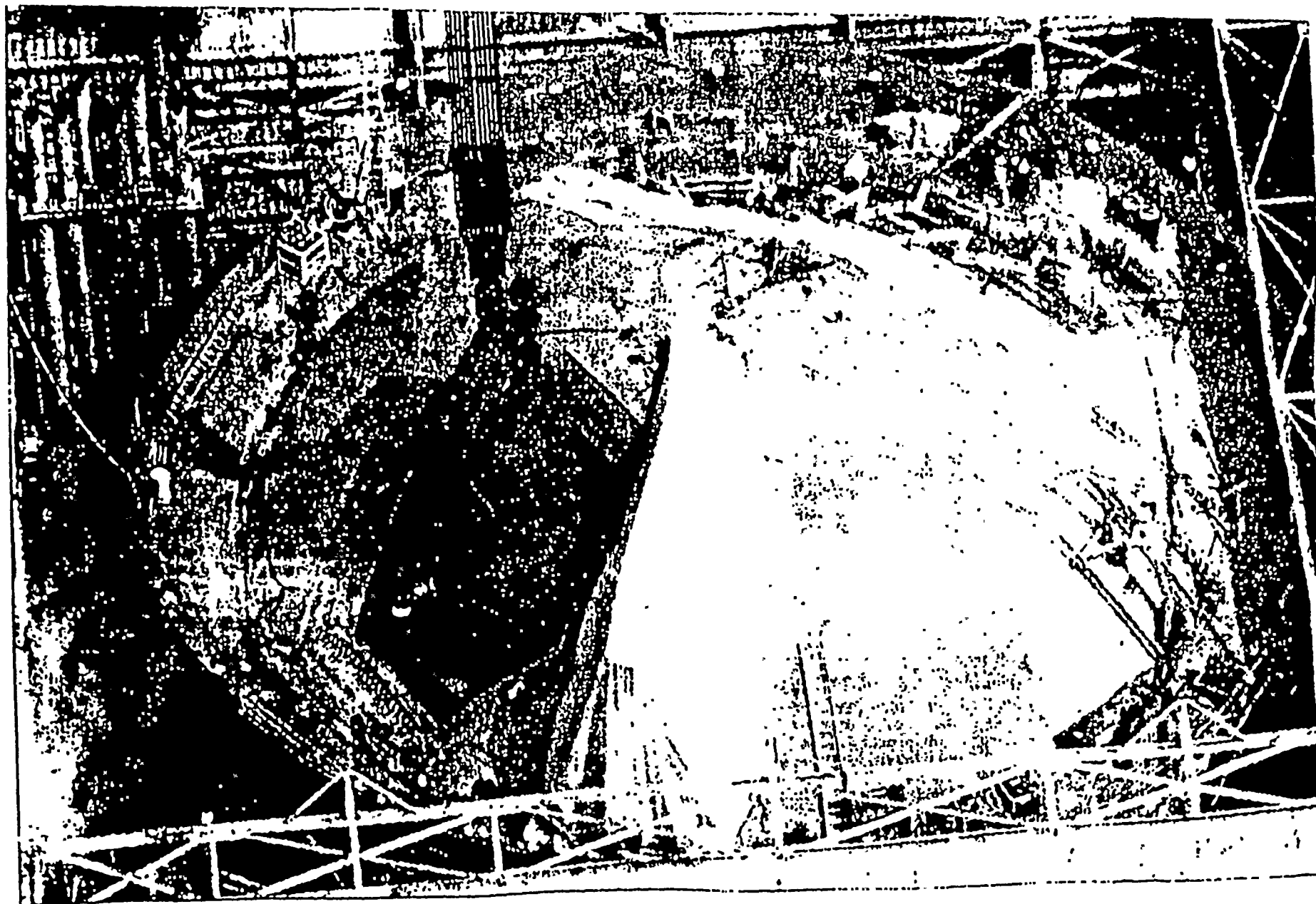
Peter Drysdale, senior resident inspector at Ginna for the federal Nuclear Regulatory Commission, said the four lifts through two holes in the containment dome released radiation "just barely above background" levels.

Despite nuclear-power critics' concerns, there is no data to corroborate fears about the holes in the dome, said James Riccio, an Atlanta-based nuclear industry analyst with the watchdog group Public Citizen. □



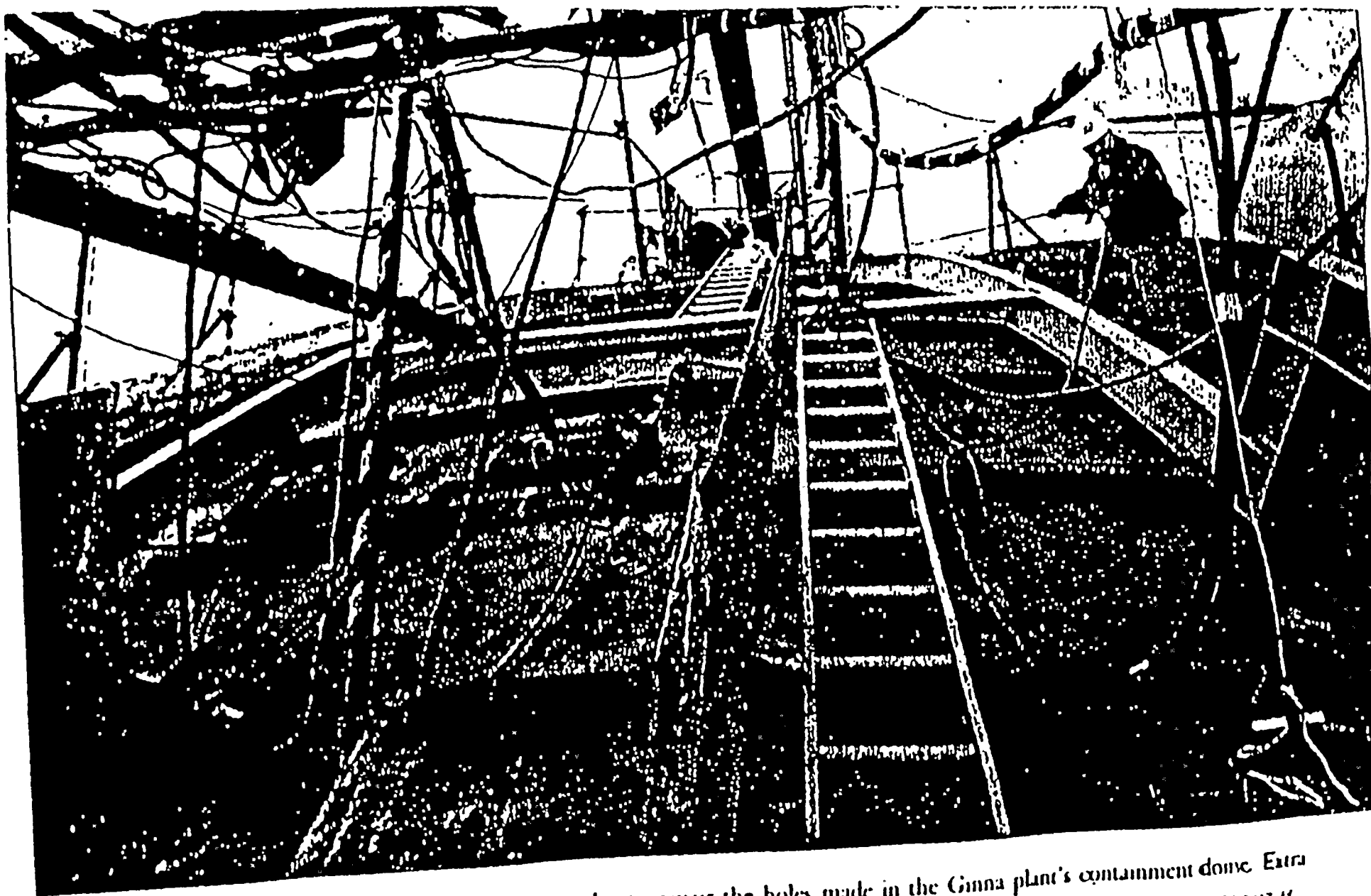
THURSDAY, APRIL 25, 1996

Democrat and Chronicle



Finally in place Workers at Ginna nuclear plant lower the second new steam generator through the roof of the containment dome yesterday. The lift completed a historic phase in the repairing and refueling of the Rochester Gas and Electric facility.





They home the dome Construction crews work yesterday to repair the holes made in the Ginna plant's containment dome. Extra concrete will make the structure stronger than it was before the generator-replacement BEGAN LAST MONTH.



Gaping Ginna holes get patch

Patching the containment dome roof

Steel stiffeners are permanently attached to the steel plate to maintain its shape.

The finished welds on the steel plate are X-rayed to detect any flaws.

1 The first step in sealing the containment dome is to replace the steel plates and weld them back in place. This takes 2 1/2 days. The two plates together weigh 11 tons.

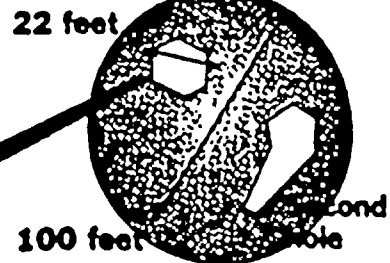
2 The second step is to replace the steel rebar (reinforcing rods used inside concrete). This takes seven days.

3 The third step is to build wooden forms over the holes to pour concrete into. This takes one day.

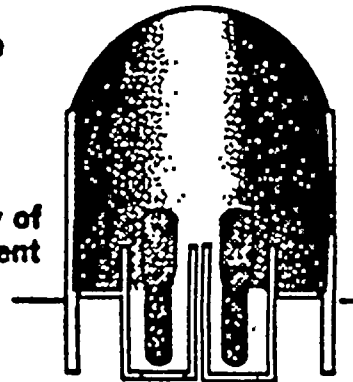
4 The fourth step is to pour the concrete. This takes one day. The concrete has a compressive strength of 5,000 pounds per square inch. By comparison, concrete used in sidewalks is rated at 2,000 psi. About 187 cubic yards of concrete – equal to 18 truckloads – will be used to cover both holes.

Sensors attached to the rebar will monitor stresses when the containment dome is pumped up with air to test the patches.

Top view of containment dome



Side view of containment dome



Cadweld

Old and new rebar are spliced and fused by cadwelding. This 70-year-old process employs a sleeved coupling filled with metallized gunpowder and ignited with a torch.

Cadweld

Rebar

Cadweld

The new rebars weigh a total of 150 tons.



Generators installed, crews begin welding

Democrat and Chronicle
FRIDAY, MAY 3, 1990

ONTARIO — Almost 120 feet above the ground, at the end of a break-a-sweat climb up metal stairs, workers perched on the containment dome at the Ginna nuclear power plant today will put the final touches on a big welding job.

The world is watching.

The generator replacement project has been the first in which a nuclear plant's main protective barrier has been breached to make repairs — and now it's time to seal up two gaping holes.

The workers — part of a temporary force of 500 at the Rochester Gas and Electric Corp. facility — are reattaching two massive steel plates removed last month so crane operators could lift two new steam generators the size of small submarines through the dome.

Though at least 22 steam generator replacement projects have been finished worldwide, most used equipment hatches to remove the old machines and put in the new.

Two employed holes cut in the side of the containment buildings.

The new generators — and the holes they required — are the heart of the \$115 million project to repair and refuel the Vietnam War-era Ginna plant, first opened in 1970.

The project to repair the dome, scheduled to take about 12 days, involves welding the plates in place; replacing crisscrossed layers of reinforcing steel called rebar; and then sealing the patches with concrete.

"It's all conventional construction technology," said Edwin H. Grey, overseeing the project for the federal Nuclear Regulatory Commission's regional Division of Reactor Safety. A veteran of 287 oversight trips for the NRC, Grey called the Ginna project "well planned."

The patched containment dome will be stronger than the original, said RG&E project manager John F. Smith.

Welds are stronger than original metal, he said, and steel "stiffeners" have been added to the slightly curving patched plates, boosting their strength.

Over the past two days, welders using torches fueled by a mixture of argon and carbon dioxide gases have super-heated carbon steel wire to reattach the plates to the rest of the dome's steel liner. Their work is checked with X-rays. Any flaws are ground out and rewelded.

Over the next seven days, new steel rebars, pre-curved to fit the dome, will be spliced in place.

The rebars are wrist-thick steel bars used to reinforce concrete. In April, about 11 tons of it was clipped away like hair to make the original holes.

Imploding sleeves stuffed with gunpowder and ignited by torches fuse old rebar to new, a process known as Cadwelding.

Next, a wooden form will be built over the exposed patches of rebar and steel plate. A day's work.

After that, it will take another day to pour 187 cubic yards of custom concrete, sealing the repair for good. It seasons in five days. Ordinary concrete takes 28 days to cure.

The tough concrete is typically used in nuclear plants or building designed to house electric switches.

In late May, the structural integrity of the containment dome will be tested by air pressure up to 70 pounds per square inch — 125 percent of design capacity.

Special sensors will measure the strain on rebars and "deflections" in the dome itself.

The entire project, done when the refueled reactor starts producing electricity again, should conclude June 2 — five days ahead of schedule, said Smith. □

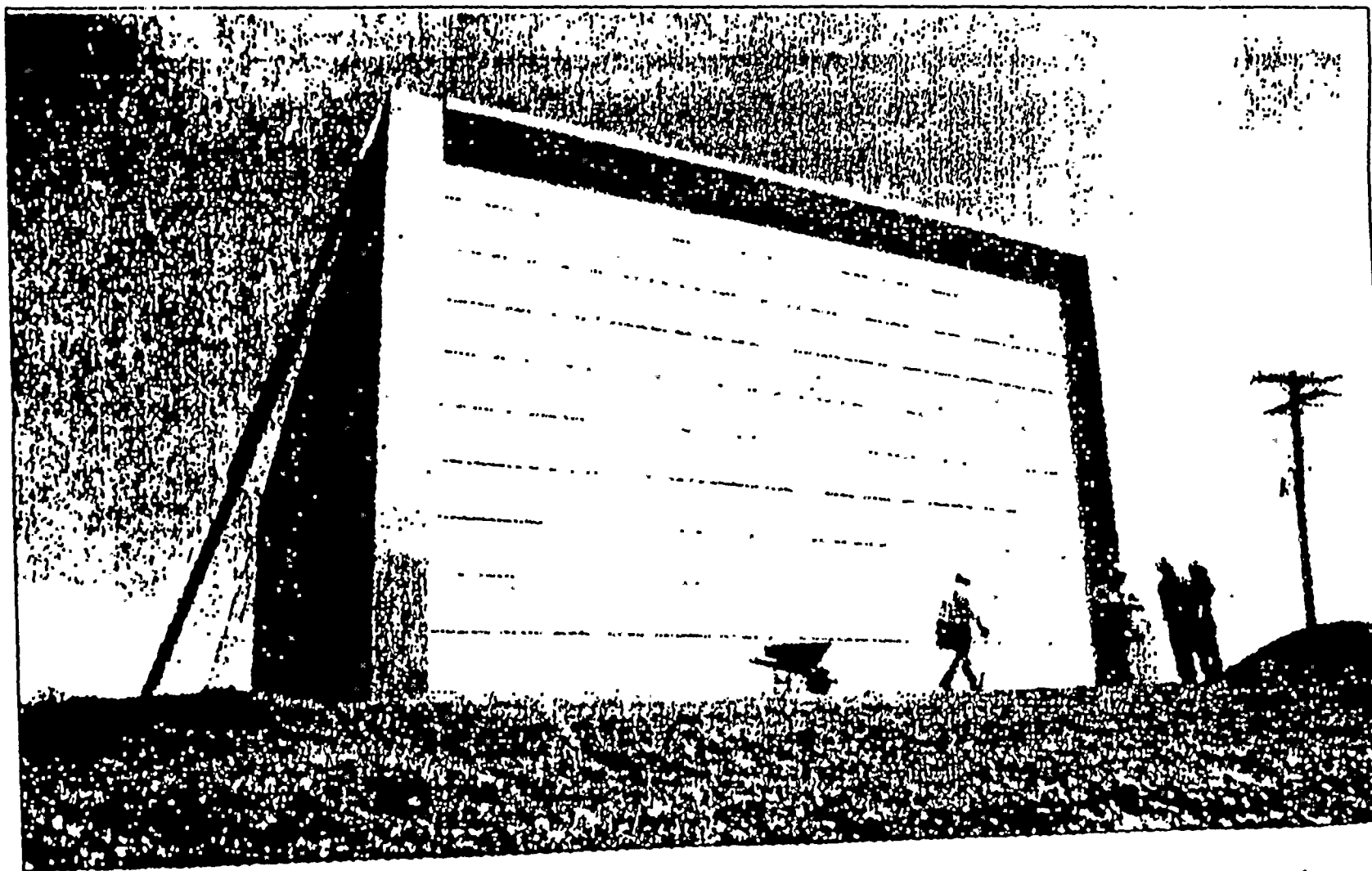


WEDNESDAY MAY 9, 1996

Democrat and Chronicle

632 tons of 'hot' junk

RG&E must decide what to do with old Ginna generators



Locked up The two steam generators removed from the containment building at the Ginna nuclear power plant are



THURSDAY, MAY 9, 1996

RG&E is studying what to do with the old steam generators from the Ginna nuclear power plant, which amount to about 632 tons of radioactive scrap.

One option might be to "recycle" the old equipment. But that's a complicated process, and if it proves unworkable, the company could send it to a low-level nuclear waste dump or continue to store the generators on site.

The concrete vault that has housed the steam generators for several weeks can hold them safely until Ginna's operating license expires in 2009, according to RG&E, which owns the plant in Ontario, Wayne County.

Some environmentalists oppose on-site storage, saying nuclear plants' proximity to water makes them the wrong place for nuclear waste. But others say they should stay put because moving or "recycling" the steam generators simply spreads the problem around. Closing all nuclear reactors is the best option, according to the Nuclear Waste Project in Washington, D.C.

The two old steam generators, shaped like top-heavy capsules, were pulled through holes in the roof of the reactor dome last month by a 340-foot tall crane. The new ones are in place and workers are patching the dome to prepare to restart the plant in early June.

A number of nuclear power plants around the country already have replaced their steam generators and most are storing the old equipment on site.

At Ginna, the old steam generators, which give off potentially hazardous doses of radiation from cobalt 60 and other material, are housed inside concrete vaults that block almost all radiation, said

Richard J. Watts, manager of nuclear assessment at RG&E.

The building is 75 feet long, 60 feet wide and its walls are 2.5 feet thick. The highest radiation readings from the building are on the roof, where it measures 0.15 millirem per hour, about 30 times the rate of background levels, Watts said. The rate drops to background levels a few feet away, he said.

But there's no guarantee this concrete mausoleum will be watertight, said Connie Kline, former nuclear committee chair for Ohio Sierra Club, which has fought "dry cask" storage of used nuclear fuel at the Davis-Besse plant near Toledo.

Nuclear plants are environmentally inappropriate places to store any kind of radioactive waste because they are located on rivers, lakes or oceans and sometimes sit in wetland areas, Kline said. Erosion, flooding and high water tables are potential problems, she said.

"It's sure insanity, in my estimation, to consider leaving this waste for any length of time on these sites," Kline said.

Ginna sits on the shore of Lake Ontario, one of four U.S. reactors and 12 Canadian reactors on the lake.

The concern is that water can corrode the steam generators and carry radioactive contaminants outside the vault. But Peter Drysdale, Ginna's senior resident inspector from the Nuclear Regulatory Commission, said the concrete vault is safe from the elements.

"There's no way water could get into that facility," Drysdale said.

The sump pump in the vault will be monitored regularly, said RG&E's Watts. In addition, the steam generators have been sealed with a special paint and a heavy plastic wrap.

RG&E might be monitoring the vault now, but what happens if the plant is sold, asks Ray Todd, who lives within a mile of the plant. Because Ginna already is a nuclear dump, monitoring will be crucial

issue when the plant eventually is decommissioned, Todd said.

NRC spokesman Victor Dricks said the new owner would have to prove it had the ability to monitor a closed-down nuclear plant before regulators would allow RG&E to transfer the operating license for Ginna. The NRC would make sure the plant is "decommissioned" in such a way that it remains safe, Dricks said.

Although RG&E insists the steam generators are safe inside the vault, the company looked at bids for hauling the scrapped equipment to a low-level nuclear waste dump, Watts said.

That option was used by the Yankee Rowe plant in Massachusetts, which has been shut down and is being dismantled. Its steam generators were filled with concrete and buried whole at a disposal site in Barnwell, S.C.

The dump in Barnwell, which accepts nuclear waste from New York state, charges up to \$500 per cubic foot, Watts said. Each steam generator, including insulation, has a volume of 7,656 cubic feet.

Although RG&E would get a volume discount, disposal and transportation still would be a big bill, said Watts, who said the bid from Barnwell was confidential. Recycling, although a new technology, appears to be more economical, he said.

The Electric Power Research Institute in Palo Alto, Calif., funded by the nation's utilities, has been developing techniques to decontaminate the steam generators. Several companies are testing the process, which pumps a chemical solution through the tubing of the steam generator to remove the radioactive material, said Chris Wood, manager for low-level waste at the institute. Radioactive material is filtered from the solution and disposed of at a radioactive dump.



THURSDAY, MAY 9, 1996

Democrat and Chronicle

Rubble from project will be buried on site

By JANET LIVELY
STAFF WRITER

RG&E will bury 1,670 cubic yards of slightly radioactive dirt and rubble generated by the steam generator replacement project on the grounds of the Ginna nuclear power plant.

The material will be buried west of the plant near an existing "spoils pile" left from original construction. The state Department of Environmental Conservation has granted a variance to allow RG&E to bury:

■ 1,600 cubic yards of soil, gravel and pavement excavated to build a

concrete pad for the giant crane. The material contains traces of cobalt-60, cesium-134 and cesium-137.

■ 70 yards of concrete and reinforcing bars removed from the plant's containment dome. This material contains traces of cesium-137, cesium-134, cobalt-60, europium-152 and europium-154.

The DEC variance says RG&E can bury the material on site because it will "result in trivial doses of radiation (if any) to the potential maximally exposed member of the general public."

A person standing on top of the pile for 200 hours would receive 3/10,000 of a millirem of extra radiation, according to Richard J. Watts, RG&E manager of nuclear assessment. A millirem is a measurement of radiation; background radiation in Rochester is about 320 millirems per year.

The soil and outer concrete from the containment dome material were contaminated in 1982 when a tube ruptured inside a steam generator and caused a release of radioactive steam. Other material from the dome is contaminated from normal operation. □

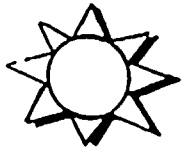


WEATHER REPORT

Today

Mostly
sunny
and cool.

High 50 to 55. Partly
cloudy tonight. Low
near 35.



It's fairly rare to have snow chill May's air

Mother Nature certainly has a strange sense of humor producing a rare Mother's Day



**KEVIN
WILLIAMS**

snow in Rochester. The 1.5 inches of snow that fell Saturday night and yesterday morning was the second latest 1-inch-plus snowfall in history and the latest 1-inch-plus snowfall

since 1908.

We now have had 197 days between the season's first and last snowfall! The season total stands at 130.3 inches, which ranks as the 10th greatest on record.

Elsewhere, snowfall amounts of several inches were reported across the higher elevations of northern New York, including 4 to 6 inches in the Montague area in the Tug Hill Plateau. Heavy snow also fell in the mountains of northern new England.

In addition to the snow, temperatures were at absurd levels for mid-May. The afternoon temperatures in the mid-40s this past weekend were more typical of mid-March than mid-May.

When one factored in the wind chill, temperatures were at times in the single digits Saturday night and yesterday morning.

And this morning, temperatures were expected to flirt with the 32 degree record low, which was set back in 1895.

Fortunately, there is some better news as we look ahead.

The coastal storm that produced the record snow and cold as well as flooding is departing via the Canadian Maritimes.

In the storm's wake will come a milder and more moderate pattern this week with high temperatures returning to the more seasonable 60s by mid-week. ☐



LOCAL/STATE

THURSDAY, MAY 16, 1996

Democrat and Chronicle

ROCHESTER, NEW YORK

Ex-RG&E boss Robert Ginna dies

He was pioneer in nuclear power

Robert Emmett Ginna, former chairman of the board and chief executive officer of Rochester Gas and Electric Corp. and a pioneer in generating electricity through nuclear power, died yesterday at St. Ann's Home in Irondequoit. He was 93.

Mr. Ginna, who was associated with RG&E for 41 years, served as its chief executive officer from 1957 to 1967. At a time of steady growth, he led the company into the construction of a nuclear power plant.

The plant in Ontario, Wayne County, was named for him before it went into operation in 1969.

"The electric utility industry was searching for new ways to meet increased demand. He was the right person for the times," said Roger W. Kober, RG&E's chairman and chief executive officer.

A family member said Mr. Ginna "exulted" in the weeks before his death about RG&E's project to upgrade the plant by replacing its twin steam generators.

Mr. Ginna was born in Brooklyn, the son of John F. Ginna and Emma Flanagan Ginna. His father was a designer and manufacturer of furni-

He could not attend school until the age of 8 because of debilitating health conditions that, for a time, confined him to a wheelchair. He suffered from rheumatic fever and developed a heart murmur.

He studied briefly at night at Brooklyn Polytechnic Institute. He then took courses in economics at New York University and a correspondence course in law. It was the start of a lifetime of learning.

"It wouldn't be a tragedy to me if I were physically unable to do anything but read, understand and converse with people," Mr. Ginna said in a 1971 *Times-Union* article. "I think I could go on. But I'd hate to be a cabbage; I don't think I'd last long if I didn't have something to keep my mind alert."

Family members said in spite of many physical problems, he was alert almost to the day of his death.

Mr. Ginna started his career as a cadet engineer with Brooklyn Edison Company. He then became an engineering consultant and worked throughout the United States.

He consulted with RG&E in the late 1920s and joined the company full time in 1934. In his RG&E career, Ginna rose from executive vice president to president to director and board chairman.

Mr. Ginna always was eager to find new ways to do things.

He often said: "If you don't change, change will change you."

In 1952, Mr. Ginna was one of the executives of 22 companies who formed Atomic Power Development Associates, a company that built an experimental breeder reactor in Michigan.

He was the president of High Temperature Reactor Development Associates, a consortium of 53 companies that built a prototype nuclear reactor in Peach Bottom, Pa., that supplied power to Philadelphia Electric Co.



Ginna

At the dedication ceremony of the Ginna nuclear power plant, Glenn T. Seaborg, chairman of the U.S. Atomic Energy Commission and a Nobel Prize winner, said Mr. Ginna had been "a wise and vigorous champion of nuclear-electric power."

RG&E had a policy that required executives to retire on the first of the month following their 65th birthdays. But Mr. Ginna wasn't ready to abandon nuclear energy.

He traveled the world as an apostle of nuclear power. He also served as a consultant on nuclear energy to many governments and

In his free time, Mr. Ginna enjoyed golf, hunting, swimming and traveling.

He insisted the Ginna power plant was painted green not because it was his favorite color but because it would better blend into the surrounding landscape.

Mr. Ginna was a founding regent of St. John Fisher College.

He was also actively involved in many Rochester organizations. Among others, he served as director of the Security Trust Company of Rochester, the Rochester Memorial Art Gallery, Rochester Community Chest and the Greater Rochester Hospital Fund.

In 1965, he received a papal knighthood in the Order of the Holy Sepulchre.

He is survived by his son, Robert E. Ginna Jr. of Jaffrey Center, N.H.; his daughter, Margretta Michie of Penfield; his sister, Mary Ginna of Brooklyn; seven grandchildren; and five great-grandchildren. His wife of 52 years, the former Margaret McCall, died in 1976.

Funeral arrangements were incomplete last night. □

From: EDIN

Subject: EDIN - ROBERT GINNA DIES

ROCHESTER GAS AND ELECTRIC CORPORATION
EMPLOYEE DAILY INFORMATION NETWORK - EDIN

THIS IS AN EDIN MESSAGE/MESSAGE SEQUENCE NUMBER 119051696 - PUBLIC AFFAIRS
MAY 16, 1996

Following the death of Bob Ginna yesterday, the following RG&E news announcement was released last evening.

(May 15, 1996) -- Robert Emmett Ginna, an early crusader for American nuclear energy and the inspiration behind the nuclear power plant that bears his name died today. He was 93 years old.

Mr. Ginna died at St. Ann's Home.

He served as chairman and chief executive officer at RG&E from 1957 to 1967. He retired as CEO in 1967, but at the request of the board of directors, continued as chairman until 1968. Mr. Ginna was associated with RG&E for 41 years.

The Ginna nuclear plant was named for him before it went into operation in 1969. Mr. Ginna led RG&E at a time of steady growth. "The electric utility industry was searching for new ways to meet increased demand. He was the right person for the times," said Roger W. Kober, RG&E's chairman and chief executive officer.

Today, 26 years after the Ginna plant went into commercial operation, it is rated as one of the most efficient and economical nuclear plants in the nation.

The plant was built in three and a half years at a cost of \$80 million. Annual performance statistics consistently rank it as one of the most productive nuclear plants in the U.S.

In the quest for making sure customer needs were met, Mr. Ginna was always eager to explore new ways of doing things. One of his often-stated pieces of advice was, "If you don't change, change will change you."

RG&E engineers first discussed the potential of the atom for electric energy in 1947. At that time, the federal government classified all technical information regarding nuclear power as "top secret."

Mr. Ginna was one of the country's business leaders who began urging the government in the early 1950s to allow the utility industry to cooperate in developing nuclear energy to generate electricity. As a result of his and others' efforts, technical data on the atom was made available to private industry in 1954.

Shortly thereafter, Mr. Ginna helped form and became president of a national industry consortium which united 53 companies, including RG&E, to build a prototype nuclear plant in Pennsylvania.

In 1960, Mr. Ginna committed RG&E to help create the Empire State Atomic Development Associates Inc. This was a non-profit organization funded by the state's seven taxpaying utilities to undertake further research on nuclear

power

The expertise gained in that project and those that preceded it paid divide when planning for RG&E's nuclear plant began in 1964.

By this time, Mr. Ginna was recognized not only in the U.S. but abroad as a leading proponent of nuclear energy. He was an American delegate to the World Power Conference, a group of utility executives from around the globe. In 1966, he presented one of the three main addresses at the conference's meet in Tokyo.

Although Mr. Ginna will be remembered primarily for his work in promoting nuclear power, he led campaigns in other areas of the industry that also benefitted RG&E customers.

In 1959, Mr. Ginna marshaled company arguments against a natural gas rate increase to utilities that had been approved by the Federal Power Commission. The increase was levied on RG&E by its gas supplier, and the company was compelled to pass it along to customers.

The company fought the increase for three years, and eventually the commission reversed itself and customers won a refund.

Mr. Ginna often reminded RG&E employees of the company's ongoing commitment to the customer.

He once wrote in the company's magazine for employees: "I hope that whenever you have an opportunity to contact a customer, you will remember that he or she is not a statistic in our annual report, but a flesh and blood human being with feelings and reactions like our own. Customers are never an interruption of our work; they are the purpose of it."

Mr. Ginna is survived by a son, Robert Jr., of New Hampshire, and a daughter, Margretta Michie of Penfield. His wife, Margaret, died in 1975.

Funeral services: 2-4, 7-9 today at Anthony Funeral Chapel, 2305 Monroe Avenue. Funeral Mass tomorrow at 11 AM at St. Louis Church, 60 S. Main St., Pittsford. Interment at Pittsford Cemetery.

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