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SUBJECT: Updates & suppls 810415 submittal re SEP Topic II-1.C, "Potential Hazards Due to Nearby Transportation,Industrial & Military Activities."

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JOHN E. MAIER
VICE PRESIDENT

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August 20, 1981

Director of Nuclear Reactor Regulation
Attention: Dennis M. Crutchfield, Chief
Operating Reactors Branch No. 5
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: SEP Topic II-1.C, "Potential Hazards Due to Nearby Transportation, Industrial, and Military Activities"
R. E. Ginna Nuclear Power Plant
Docket No. 50-244

Dear Mr. Crutchfield:

This letter will serve to update and supplement our April 15, 1981 submittal relative to this SEP topic. The following additional information should be added where noted:

1. After paragraph 5 of the "Description," the following paragraph should be added:

"The potential effect of the gas line service to the Ginna house heating boiler was discussed during the Ginna Fire Protection review. This 4-inch gas line comes into the plant underground until it penetrates the ground surface at the east end of the screenhouse. This routing ensures separation from all other safety-related structures and systems. At this point, a metering station and a gas shutoff valve are located (the gas meter was relocated as a result of the Fire Protection review, item 3.1.13). The gas line is buried underground again after the gas meter regulator station, and enters the building through the basement wall under the house heating boiler area. The gas pipe is of welded steel construction up to the boiler. There is continuous ventilation of the areas that the gas line passes through within the building. The gas line service to the boiler and the boiler controls were reviewed and compared to NFPA-85, as requested in the staff's Fire Protection SER, dated February 14, 1979 (item 3.1.46). This installation was accepted by the NRC in Supplement No. 2 to the Fire Protection SER, issued on February 6, 1981. Based on the resolution of all gas line items during the Fire Protection review, it can be concluded that no safety hazard results from the existence of the gas line on the plant site."

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These above-referenced documents will be added as references to the safety assessment for this SEP Topic II-1.C.

2. The following discussion should be added into the present first paragraph on page 4, following the phrase ". . . at least 23 miles or more from the plant . . ."

"The possibility of damage to the service water intake structure was also considered. Section III-B.27 of RG&E's "Technical Supplement Accompanying Application for a Full-Term Operating License," August 1972 discusses the design of the intake system. As noted in this report, the intake system is completely submerged below the surface of the lake. A ten-foot reinforced concrete lined tunnel, driven through bedrock, extends 3100 feet northerly from the shoreline. The tunnel rises vertically and connects to a reinforced concrete inlet section. The occurrence of historical low water level will result in a depth of water of 30 feet at the inlet and with 15 feet of cover over the inlet structure. This is sufficient to prevent damage from any boating which might pass in the vicinity of the structure. Further, plugging of inlet water flow by a single large piece of material is prevented by the design of the inlet structure, in that water enters on a full 360° circle.[13] Another design feature at Ginna to ensure continued availability of essential service water is that service water intake can be directly drawn from the discharge canal, which is located on the plant site, protected from any potential lake boating. Thus, lake navigation is not considered to be a hazard to the plant."

This referenced document will be added as a reference to the safety assessment for this SEP Topic II-1.C.

3. The following sentence should be added at the top of the present page 5, after the words ". . . and training space described above."

"There is also a slow-speed low altitude military training route (SR-826) which passes about 6 miles west of the plant."

An updated assessment of this SEP Topic, including all changes noted in this letter, is included as an Attachment.

Very truly yours,

John E. Maier

Attachment

Attachment: SEP Topic II-1.C - Potential Hazards Due To Transportation, Institutional, Industrial and Military Facilities, R.E. Ginna Nuclear Plant

Purpose

The safety objective of this topic is to ensure that the Ginna Nuclear Plant is adequately protected and can be operated with an acceptable degree of safety with regard to potential accidents which may occur as the result of activities at nearby industrial, institutional, transportation, and military facilities. The review was conducted in accordance with the guidance of SRP's 2.2.1, 2.2.2, 2.2.3 and 3.5.1.6, as well as Regulatory Guide 1.91, Rev. 1.

Description

There is little industrial activity in the vicinity of the Ginna plant. Wayne County, where Ginna is located, is primarily a rural area. Typical industries for Wayne County are shown in Table 2.5-1 of the FSAR, reproduced here as Table 1. The nearest concentration of industrial activity is located in the town of Webster, about 6 miles from the site, and consists primarily of light manufacturing (Xerox copiers). No industrial development is expected to occur in the vicinity of the Ginna site.

The nearest transportation routes to the plant are Lake Road and U.S. Route 104, which pass about 1700 feet and 3 1/2 miles, respectively, from the plant at their closest point of approach.

The guidance of Regulatory Guide 1.91, Revision 1, was utilized to evaluate the consequences of postulated explosions on Lake Road. Regulatory Guide 1.91, Revision 1, has been specifically identified by the NRC's Regulatory Requirements Review Committee as needing consideration for backfit on operating reactors. The highway separation distances at Ginna exceed the minimum distance criteria given in the Regulatory Guide and, therefore, provide reasonable assurance that transportation accidents resulting in explosions of truck-size shipments of hazardous materials will not have an adverse effect on the safe operation of the plant. It is important to note that no hazardous cargo would be expected to be transported along Lake Road. This road is used primarily for local traffic, such as that relating to the apple processing plants. No industry using large quantities of explosives is located along this route. Any large quantities of hazardous material would be shipped via U.S. Route 104 which, at 3 1/2 miles from the plant site, is sufficiently distant not to be of concern.

Highway accidents on Lake Road involving certain hazardous chemicals could theoretically exceed toxicity limits in the plant control room assuming an optimum set of spill parameters and atmospheric dispersion conditions. However, the highway separation distances and the lack of any indication of frequent shipment of hazardous chemicals past the plant (since shipment would be along U.S. Route 104), provide reasonable assurance that the likelihood of a hazardous chemical spill affecting the operation of the plant is low. However it cannot be precisely determined what the probability of a hazardous chemical accident would be, because detailed

information on the size, type, and frequency of hazardous chemical shipments past the plant is not available. Although it is considered that the probability of a hazardous chemical transportation accident affecting plant operation is low, we believe that the possibility of such an accident should be one of the factors considered in the final evaluation of the adequacy of the control room habitability systems for the Ginna Plant. This matter will be evaluated further under NUREG-0737, item III.D.3.4, "Control Room Habitability".

The nearest railroad to the plant is the Ontario Midland railroad about 3 1/2 miles to the south. Comparing this distance with the guidance provided in Regulatory Guide 1.91, it is apparent that potential railroad accidents involving hazardous materials are not considered to be a credible risk to the safe operation of the plant.

The nearest large pipelines to the plant are a 12" gas line located about six miles southwest of the plant, and a 16" gas line located about 10 miles south of the plant. These pipelines are far enough removed to assure that pipeline accidents will not affect the safety of the nuclear plant. Figure 3 shows a portion of the residential gas lines serving homes along Lake Road, as well as the house heating boiler at the Ginna plant itself. There are no gas or oil production fields, underground storage facilities, or refineries in the vicinity of the plant.

The potential effect of the gas line service to the Ginna house heating boiler was discussed during the Ginna Fire Protection review. This 4-inch gas line comes into the plant underground

until it penetrates the ground surface at the east end of the screenhouse. This routing ensures separation from all other safety-related structures and systems. At this point, a metering station and a gas shutoff valve are located (the gas meter was relocated as a result of the Fire Protection review, item 3.1.13). The gas line is buried underground again after the gas meter regulator station, and enters the building through the basement wall under the house heating boiler area. The gas pipe is of welded steel construction up to the boiler. There is continuous ventilation of the areas that the gas line passes through within the building. The gas line service to the boiler and the boiler controls were reviewed and compared to NFPA-85, as requested in the staff's Fire Protection SER, dated February 14, 1979 (item 3.1.46). This installation was accepted by the NRC in Supplement No. 2 to the Fire Protection SER, issued on February 6, 1981.

Based on the resolution of all gas line items during the Fire Protection review, it can be concluded that no safety hazard results from the existence of the gas line on the plant site.

There are no large commercial harbors along the southern shore of Lake Ontario near the plant. Some freight is shipped through Rochester harbor about 20 miles to the west. Major shipping lanes in the lake are located well off-shore, at least 23 miles or more, from the plant.[7] The possibility of damage to the service water intake structure was also considered. Section III-B.27 of RG&E's "Technical Supplement Accompanying Application for a Full-Term Operating License," August 1972 discusses the design of the intake system. As noted in this report, the intake

system is completely submerged below the surface of the lake. A ten-foot reinforced concrete lined tunnel, driven through bedrock, extends 3100 feet northerly from the shoreline. The tunnel rises vertically and connects to a reinforced concrete inlet section. The occurrence of historical low water level will result in a depth of water of 30 feet at the inlet and with 15 feet of cover over the inlet structure. This is sufficient to prevent damage from any boating which might pass in the vicinity of the structure. Further, plugging of inlet water flow by a single large piece of material is prevented by the design of the inlet structure, in that water enters on a full 360° circle.[13] Another design feature at Ginna to ensure continued availability of essential service water is that service water intake can be directly drawn from the discharge canal, which is located on the plant site, protected from any potential lake boating. Thus, lake navigation is not considered to be a hazard to the plant.

The closest airport to the plant is the Williamson Flying Club Airport, a small privately-owned general aviation facility located approximately ten miles ESE. Monroe County Airport, in Rochester, New York, located about 25 miles southwest of the plant, is the nearest airport with scheduled commercial air service. Low altitude federal airways V2 and V2N pass about 10 miles south and 2 1/2 miles southwest of the plant, respectively.

An Air Force Restricted Area R-5203 is located about eight miles north of the plant site. Whenever flight activity is conducted by the Air Force within R-5203, radar surveillance is maintained by the 21st NORAD Region, the 108th Tactical Control Group, or

possibly the Cleveland Air Route Traffic Control Center. Pilots rely upon on-board navigational equipment to maintain their presence within the specified limits of the restricted area. Pilots can also be advised if their aircrafts stray beyond their limits by the radar surveillance unit covering the area at the time. The restricted area is used daily for military flight training which includes high-speed interceptor training maneuvers, operational flight checks, and air-to-air refueling. The current altitude ranges from 2,000 to 50,000 feet above the surface.[5] A portion of the Detroit Sectional Aeronautical Chart, reproduced as Figure 1, shows the airports, air routes, and training space described above. There is also a slow-speed low altitude military training route (SR-826) which passes about 6 miles west of the plant.

The Williamson Flying Club Airport has one paved runway. This runway, designated 10-28 and thus oriented in an almost east-west direction, is 3377 feet long and 40 feet wide. The main runway is equipped with low intensity runway lights. The airport has instrument approach capability to runway 28 from the Rochester VORTAC. Figure 2 shows the instrument flight path. There is no control tower at this airport. The airport is used for general aviation activities such as business and pleasure flying, and for agricultural spraying operations. There are currently about 5,000 operations per year at the facility, and about 30 based aircraft, including part-time based crop dusters. The great majority of the aircraft are single-engine propeller airplanes which typically weigh on the order of 1500 to 3600 pounds.[8]

The low altitude federal airways, V2 and V2N, serve about 19 flights per day. Almost all flights use V2, with V2N being used only occassionally. At most, 10% of airline traffic would use V2N. The width of these airways are eight miles.[9]

Evaluation

Based on distance from the reactor, it has been determined that truck and seaway traffic, railway transportation, and large gas and oil pipelines are not of concern to the Ginna safety-related equipment, with respect to the potential for detonation of explosives. With respect to hazardous chemical shipments and the potential effect on control room habitability, the Ginna plant will be further evaluated through NUREG-0737, item III.D.3.4.

Aircraft hazards to Ginna were reviewed against the criteria in SRP 3.5.1.6. Acceptance criterion II.2 states that, for military air space, a minimum distance of five miles is adequate for low level training routes, except those associated with unusual activities, such as practice bombing. Air Force Restricted Area R-5203 is about eight miles from at its closest boundary, and no unusual activities such as practice bombing take place. The slow-speed low altitude military training route SR-826 is about 6 miles from the plant. Therefore, this criterion is met. Section III.2 of SRP 3.5.1.6 states that the probability of an aircraft crash into the plant should be less than about 10^{-7} per year. This probability can be evaluated using the relationship:

$$P_{FA} = C \times N \times A/w$$

where:

C = inflight crash rate per mile for aircraft using airway (assumed to be 3×10^{-9})

w = width of airway (plus twice the distance from the airway edge to the site when the site is outside the airway) in miles,

N = number of flights per year along the airway, and

A = effective area of plant in square miles = 30 acres / 0.5 miles^2

For airway V2,

$$P_{FA} = (3 \times 10^{-9}) \times (19 \times 365) \times \frac{.05}{20} = 5.1 \times 10^{-8}$$

where W = 20 is derived from an air width of 8 miles + twice the six-mile distance from the airway edge to the site.

For airway V2N (assuming 10% of the 19 flights),

$$P_{FA} = (3 \times 10^{-9}) \times (2 \times 365) \times \frac{.05}{8} = 1.4 \times 10^{-8}$$

Since these values are below 1×10^{-7}, it is apparent that commercial air traffic over Ginna is not of concern.

Section III.3 of SRP 3.5.1.6 states that the probability of an aircraft crashing into the site should be estimated for cases where either of the following apply:

a. An airport within five miles of the site.

b. An airport with projected operations greater than $500d^2$ movements per year is located within ten miles of the site, or an airport within projected operations greater than $1000d^2$ movements per year is located beyond ten miles from the site, where "d" is the number of miles from the site.

The only airport potentially of concern is the Williamson Flying Club Airport. This airport is about 10 miles from the site, with expected operations of 5000 per year. This is substantially fewer than the $500d^2 = 500\ (10)^2 = 50{,}000$ movements per year which would be of concern. There is therefore no need to evaluate the probability of an aircraft crash from this airport.

Conclusions

The R.E. Ginna site meets a current regulatory criteria for "Potential Hazards Due to Transportation, Institutional, Industrial and Military Facilities", except possibly for the consideration of hazardous chemical highway transportation accidents on Lake Road. Although this latter issue is not expected to be of concern, since hazardous materials would be expected to be transported along U.S. Route 104, which is 3 1/2 miles from the site, the issue will be further considered in the evaluation of Control Room Habitability as part of the NUREG-0737 item III.D.3.4 review.

Since the only potential deviation from current regulatory criteria is to be addressed outside of the SEP, it is considered that SEP Topic II-1.C is complete for Ginna, and no additional evaluation will be required for this topic within the SEP.

References

1. Rochester Gas and Electric Corporation, Robert Emmett Ginna Nuclear Power Plant Unit No. 1 - Final Facility Description and Safety Analysis Report (FSAR), Sections 2.2 and 2.5.
2. Rochester Gas and Electric Corporation, R.E. Ginna Nuclear Power Plant Unit No. 1, Environmental Report, Volume 1, Sections 2.1 and 2.2.
3. Nuclear Regulatory Commission NUREG-75/087, Standard Review Plan, Sections 2.2.1, 2.2.2, 2.2.3, and 3.5.1.6, September 1975.
4. Code of Federal Regulations, Section 10, Part 100 (10 CFR 100).
5. Sterling Power Project Nuclear Unit No. 1 Preliminary Safety Analysis Report Addendum, Rochester Gas and Electric, Volume 1, Sections 2.1 and 2.2.
6. U.S. Nuclear Regulatory Commission Regulatory Guide 1.91, Rev. 1, February 1978.
7. Conversation with Chief, U.S. Coast Guard Station, Rochester, New York, 4/8/81.
8. Conversation with Vern Tyrrell, manager of the Williamson Flying Club Airport, 4/7/81.
9. Conversation with FAA controller, Monroe County Airport, 4/8/81.
10. Fire Protection SER, Dennis L. Ziemann to Leon D. White, Jr., February 14, 1979.
11. Fire Protection SER, Supplement No. 2, Dennis M. Crutchfield to John E. Maier, February 6, 1981.

12. Letter, Dennis M. Crutchfield, NRC, to John E. Maier, RG&E, SEP Topics II-3.A, II-3.B, II-3.B.1, II-3.C, dated April 10, 1981.

13. Rochester Gas and Electric Corporation, "Technical Supplement Accompanying Application for a Full Term Operating License," August 1972.

Table 1

FSAR TABLE 2.5-1

TYPICAL INDUSTRIES IN WAYNE COUNTY

Company and Product	Distance from Site	Direction from Site
National Distillers & Chemical Corp. (Kordite Div.), Macedon Polyethelene Products	14-1/2 mi.	South
Duffy-Mott Co., Inc. Williamson Baby Foods	8-1/2 mi.	Southeast
Garlock, Inc. Palmyra Mechanical Packings	15 mi.	Southeast
Bloomer Bros. Co. Newark, Folding Paper Boxes	19 mi.	Southeast
Jackson Perkins Co. Newark Nurserymen	19 mi.	Southeast
Sarah Coventry, Inc. Newark Direct-mail sales of costume jewelry	19 mi.	Southeast
National Biscuit Co. (Dromedary Co. Div.) Lyons, Cake mixes, dates and peels	19 mi.	Southeast
General Electric Co., Clyde Electronic Equipment	27-1/2 mi.	Southeast
Comstock Foods Inc., Red Creek Canned Foods	31 mi.	East
Kenmore Machine Products, Inc. Lyons Refrigerant Products	22 mi.	Southeast
Olney & Carpenter, Inc. Wolcott Canned Foods	27-1/2 mi.	East
C. W. Stuart & Co. Newark Nurserymen	19 mi.	Southeast
Francis Leggett Co., Sodus Canned Foods	12-1/2 mi.	East
The Waterman Food Products Co. Food Processing	3-4 miles	South
Ontario Kraut Corp. 7 Railroad Ave. Food Processing	3-4 miles	South SW
Victor Preserving Co. Food Processing	3-4 miles	South
Ontario Cold Storage Food Processing	3-4 miles	South SW
Waterman Fruit Products Co. Food Processing	3-4 miles	South SW
Ontario Food Products Food Processing	3-4 miles	South SW
Lyndan Products Co. Food Processing	3-4 miles	South SW

FIGURE 1

Detroit Sectional Aeronautical Chart - Rochester Vicinity

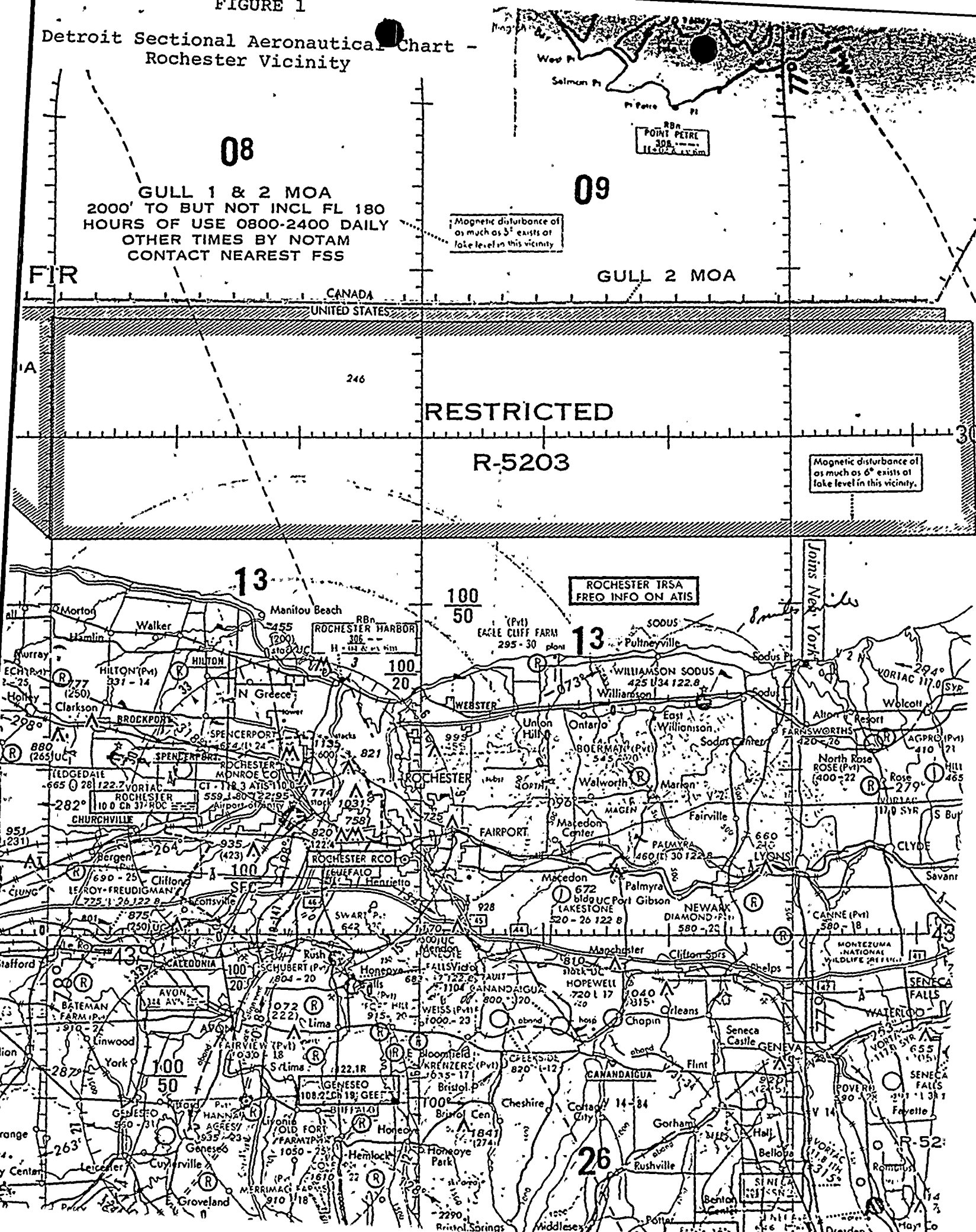
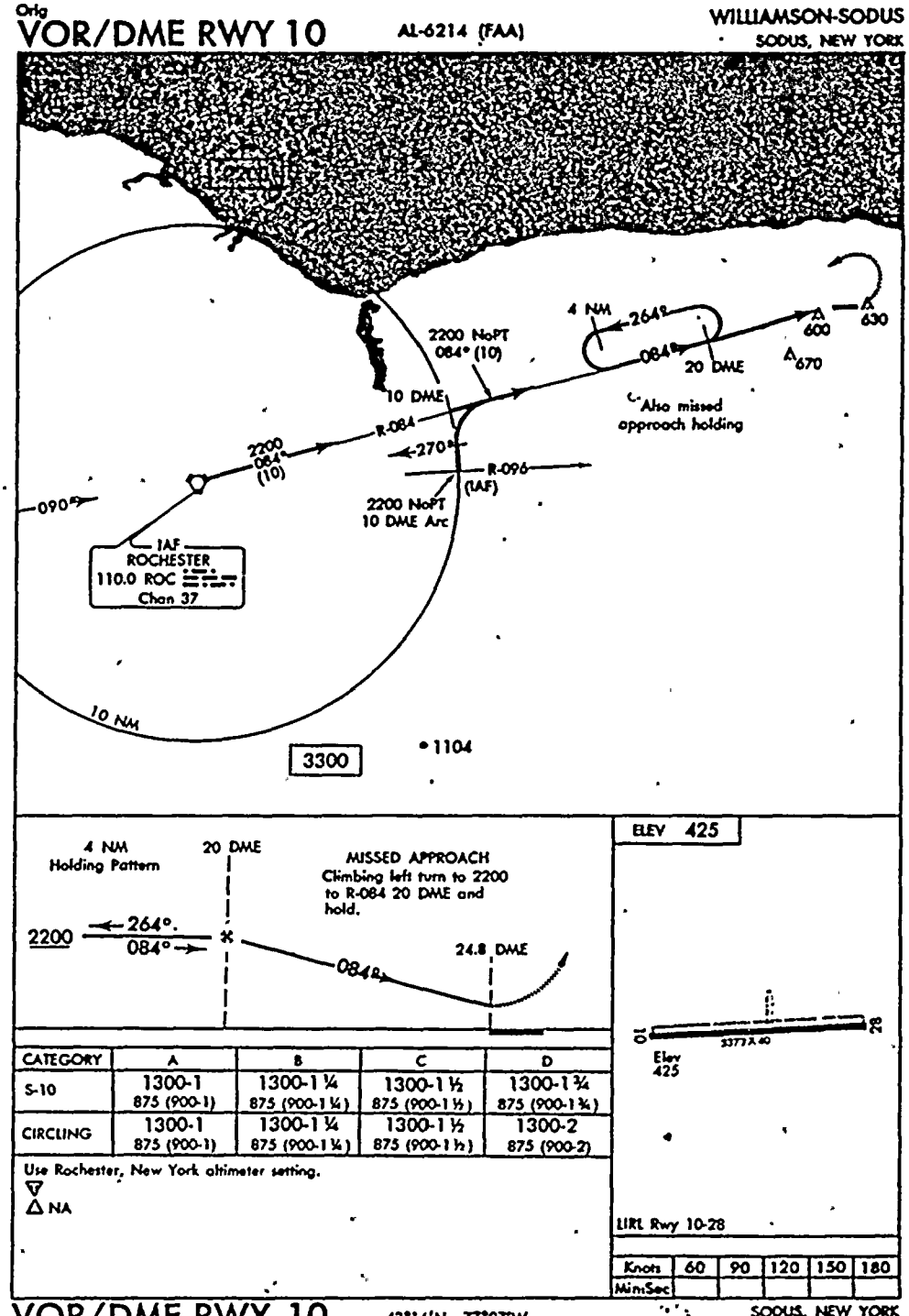


FIGURE 2

Instrument Landing Path to WFC Airport



CATEGORY	A	B	C	D
S-10	1300-1 875 (900-1)	1300-1 ¼ 875 (900-1 ¼)	1300-1 ½ 875 (900-1 ½)	1300-1 ¾ 875 (900-1 ¾)
CIRCLING	1300-1 875 (900-1)	1300-1 ¼ 875 (900-1 ¼)	1300-1 ½ 875 (900-1 ½)	1300-2 875 (900-2)

Use Rochester, New York altimeter setting.

▽

△ NA

FIGURE 3

Small Gas Lines in the Vicinity of Ginna