REPORT BY THE

Comptroller General

OF THE UNITED STATES

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Emergency Preparedness Around The Rancho Seco Nuclear Powerplant: A Case Study

At the request of Representative Robert T. Matsui, GAO evaluated emergency preparedness around the Rancho Seco nuclear powerplant, located in California about halfway between Sacramento and Stockton, and found that:

--State and county emergency plans have been developed based on Nuclear Regulatory Commission criteria; however, these plans have only been tested on a limited basis.

--Local authorities would need State and Federal assistance to handle a major nuclear emergency.

--Local residents have not been periodically informed of emergency evacuation procedures.

--Given the worst possible accident, not all of the potentially affected counties would have adequate emergency plans.

EMD-79-103
OCTOBER 2, 1979

COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-164105

The Honorable Robert T. Matsui
House of Representatives

Dear Mr. Matsui:

Your letter of April 24, 1979, asked us to review the emergency preparedness of localities surrounding the Rancho Seco nuclear powerplant near Sacramento, California. To address your questions we reviewed nuclear emergency preparedness actions of the California Office of Emergency Services, Sacramento and San Joaquin counties, and the operating utility--Sacramento Municipal Utility District. We also discussed nuclear emergency preparedness with the emergency coordinator of Amador and Calaveras Counties. Finally, we reviewed Nuclear Regulatory Commission emergency preparedness requirements and evaluated Federal agency capabilities and preparedness to assist in the event of a nuclear accident at Rancho Seco. Our evaluation of the issues you raised shows that:

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--State and county emergency-response plans have been developed for Rancho Seco based on Nuclear Regulatory Commission criteria; however, these plans have only been tested on a limited basis.

--State and local authorities appear to have adequate coordination with respect to handling nuclear emergencies. While local authorities are aware of their emergency response roles, they would need State and Federal assistance to handle a major nuclear emergency.

--Local residents have not been routinely informed of evacuation procedures in the event of an emergency. Several public meetings to discuss emergency plans were held following the Three Mile Island incident.

--Given the worst possible accident under the worst meteorological conditions, all potentially affected areas would not have adequate plans. The planning

area for this accident would include 44 counties in California and several in Nevada, with an affected population of over 8 million people.

These issues are discussed in more detail in appendix I.

In a recent report 1/ we recommended that the Nuclear Regulatory Commission revise its emergency preparedness regulations to (1) require full Federal, State, and local government participation in annual emergency preparedness drills; (2) extend emergency planning zones around nuclear powerplants from 5 miles to 10 miles; and (3) require that people living near nuclear powerplants be informed of potential hazards and planned emergency actions. The Commission is now considering these recommendations in the context of a major review of nuclear emergency planning and preparedness prompted by the Three Mile Island accident. The Commission's implementation of our prior report recommendations, the recommendations in this report, and other changes the Commission is now considering, should measurably improve emergency preparedness around Rancho Seco and other nuclear powerplants.

The California Office of Emergency Services, the Sacramento Municipal Utility District, and San Joaquin County provided written comments on this report. These comments are included as appendixes II, III, and IV. We also obtained verbal comments from Sacramento County, the emergency coordinator of Amador and Calaveras Counties, the Nuclear Regulatory Commission, and the Department of Energy. Where we considered it appropriate, we made changes to the text of the report to reflect the written and verbal comments we received. Generally, all comments agreed with our conclusions and recommendations. Some commentators said the report unduly emphasizes the worst possible accident at Rancho Seco and that accident's implications for emergency preparedness. Some commentators also expressed concern about the capabilities of State and local governments to finance expanded nuclear emergency preparedness activities. A more detailed discussion of the comments we received appears at the end of appendix I beginning on page 15.

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1/"Areas around Nuclear Facilities Should Be Better Prepared For Radiological Emergencies," EMD-78-110, Mar. 30, 1979.

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until October 15, 1979. At that time, we will send copies to interested parties and make copies available to others upon request.

Sincerely yours,

Comptroller General
of the United States

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EVALUATION OF EMERGENCY PREPAREDNESS AROUND THE RANCHO SECO NUCLEAR POWERPLANT

BACKGROUND

The Rancho Seco nuclear powerplant, operated by the Sacramento Municipal Utility District, is located off Highway 99 approximately halfway between the cities of Sacramento and Stockton. The plant produces about 900 megawatts 1/ of electricity, over 60 percent of the District's peak demand.

State and local governments, the District, and several other organizations have developed response plans for Rancho Seco, and the State plan has received Nuclear Regulatory Commission concurrence. 2/ Additionally, the Federal Government's Interagency Radiological Assistance Plan--the vehicle through which State and local governments can request Federal assistance--can be activated if a serious emergency occurs at the plant.

WHAT SORT OF EVACUATION PLANS HAVE BEEN PREPARED AT STATE AND LOCAL LEVELS?

In California local governments are responsible for planning and implementing evacuation, sheltering, and other protective actions. The State's Office of Emergency Services approves local plans, coordinates response efforts between various jurisdictions, and oversees planning and implementation of response capability at the State level. If local governments lack adequate resources to handle a particular emergency, they can request assistance from other jurisdictions, including the State. Similarly, if the State needs additional resources, it can obtain Federal assistance. Regardless of which governmental level is involved, local authorities are responsible for decisionmaking related to the health and safety of populated areas outside the plant's perimeter.

1/A megawatt is 1,000 kilowatts.

2/While States are not required to have nuclear powerplant emergency plans, the Commission encourages the development of such plans. When the Commission is satisfied with a State plan, it issues a formal letter of concurrence.

Local evacuation plans

In licensing the Rancho Seco powerplant to operate in 1974, the Commission established a 5-mile radius for emergency planning purposes. This was the area which the Commission believed might need protective action in the event of a nuclear accident involving an offsite radiological release. According to the 1970 census, 352 people live within this area. Using this criterion, only Sacramento and San Joaquin Counties needed to develop emergency response plans.

Sacramento County, which contains most of the area within the 5-mile radius, has prepared an emergency-response plan which identifies emergency organizations, specifies evacuation criteria, and establishes tasks for various county departments. Additionally, each affected department has developed procedures to be followed in case of an emergency. Also, the county has identified, trained and equipped radiological monitors who will be responsible for obtaining and communicating radiation levels to the county emergency operations center.

Under the Sacramento County plan, the County Executive is responsible for making evacuation and other emergency response decisions. In cases where this individual cannot be reached or radiation levels at the plant boundary indicate that immediate evacuation is necessary, county "alert officers" are authorized to make evacuation decisions. These alert officers, and radiological monitors, are tied into a 24-hour countywide paging system.

No similar plan exists for San Joaquin County. While the county does have a war-related nuclear emergency plan, it does not address specific problems associated with Rancho Seco, such as evacuation routes, radiological monitoring and contamination checkpoints. Sacramento County officials said their response planning is adequate to handle the small area and limited number of San Joaquin County residents located within the 5-mile radius.

In 1976 the Commission and the Environmental Protection Agency established a task force to review the planning basis for offsite preparedness around nuclear powerplants. In a November 1978 report, 1/ the task force recommended

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1/"Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants," NUREG-0396, Nov. 1978.

establishing a protective zone of about 10 miles in radius for initiating immediate emergency actions, such as evacuation. The task force believes this distance should be large enough to assure that the lower values of the Agency's limits to radiation exposure, called Protective Action Guidelines, are not exceeded outside the planning area as a result of certain types of postulated accidents. It also believes this is the most likely area in which protective action might have to be taken for releases larger than the most serious postulated accident the Commission uses in licensing nuclear powerplants. Such an accident, called the design-basis accident, might result in limited releases of radioactive materials outside the boundaries of a nuclear powerplant. The task force recommended against establishing protective zones based on the postulated worst-case accident.

The task force based its conclusion on an analysis of the early fatalities and injuries which would be expected to occur at various distances for a spectrum of postulated accidents. Their analysis showed that most early fatalities and injuries would occur within about 10 miles of a nuclear powerplant, and that rapid and efficient implementation of either evacuation or sheltering for areas within this distance is required. The task force determined that most postulated reactor core-melt accidents would not require these emergency actions beyond 10 miles. The task force also determined that beyond 10 miles, early fatalities and injuries are greatly diminished. Finally, the task force determined that although protective actions may be required for individuals located at distances beyond 10 miles, the effectiveness of various evacuation or sheltering measures used beyond this distance will not strongly influence the number of early health effects.

The Commission has not yet acted on the task force recommendation.

None of the local governments we contacted have developed response plans for evacuating the population out to a radius of 10 miles from the plant. According to the 1970 census, 6,061 people live within this area. Although Sacramento County officials believe, given their experience, that they can evacuate out to the 10-mile radius with little trouble under the current plan, other counties within the 10-mile planning zone have no formal plans and will probably have difficulty evacuating out to 10 miles. Officials from all local governments contacted told us that additional planning will be required for an evacuation planning zone out to 10 miles or beyond.

APPENDIX I

Additionally, the California Legislature is considering a bill which would require a site specific study, including analysis of a major accident. If enacted, such a law may extend the planning zone around Rancho Seco even further than the task force-recommended 10-mile area.

State emergency response plan

The California Office of Emergency Services acts as overall coordinator for nuclear powerplant response plans, insures that State resources are available in case of an accident at Rancho Seco, and coordinates activities in emergencies involving more than one county. The California plan assigns tasks to various State agencies and establishes the State's emergency organization and communication methods. Most State agencies have prepared attachments to the plan identifying resources available and establishing procedures to be followed in an emergency.

The State's basic plan appears to be comprehensive. In some cases, however, standard operating procedures required of State agencies are either missing or incomplete. For example, while the Department of Health's Radiologic Health Section has numerous responsibilities, including assisting the counties in detecting food pathway contamination, they have no plan or standard operating procedures for accomplishing these tasks. Similarly, California Department of Transportation procedures have been returned for completion by the State Office of Emergency Services. Because the Department and its radiological monitors would play an important role in an accident at Rancho Seco, it is important that the Department promptly detail its emergency procedures.

Have plans been tested?

The Commission requires all licensees to exercise their emergency plans at least once a year with offsite emergency agencies. Each exercise must test, as a minimum, the communications links and notification procedures with these offsite agencies. Rancho Seco has conducted annual exercises with Sacramento County and California's Office of Emergency Services, but none has involved San Joaquin County. Also, no other counties have participated in these exercises, and Federal emergency response agencies have not been involved in any exercises since 1975.

Although the exercises were conducted in accordance with Commission requirements, we question their effective-

ness. First, all exercises since 1975 among the utility and State and local governments were held between 8:00 and 11:00 in the morning on regular workdays. This does not insure that plant personnel working during off-shifts participate in emergency response exercises with State and local organizations, nor does it allow State and local jurisdictions to test their abilities to contact and assemble their staffs on a 24-hour basis. Because nuclear powerplant accidents can occur at any time, it is important to assure that all personnel periodically participate in exercises and that State and local jurisdictions can respond on a 24-hour basis.

Secondly, exercises have been too short to allow State and local agencies to completely test their emergency response capability or test all emergency components involved. Although Sacramento County has considerable experience in emergency evacuation, comprehensive testing of its powerplant plan is still needed to insure all responsibilities are covered and communication networks work effectively. Although Commission criteria do not require such comprehensive testing, such a requirement can improve emergency preparedness.

Similarly, although Federal agencies would probably be involved in the event of a serious accident, they have not participated in tests since 1975.

Finally, recent exercises indicate that communications problems exist between the plant operator and offsite officials. The Rancho Seco emergency-response plan designates the plant emergency coordinator as the person responsible for maintaining communications with State and local officials. This individual is also responsible for all emergency operations at the plant. According to State and local officials, plant emergency operations take precedence over communication with offsite officials. For example, in a 1978 exercise, the County was forced to contact the plant several times to obtain current data on the progress of the simulated accident. Local officials told us that communications during the most recent exercise were even worse. We believe the Commission can eliminate this problem by requiring utilities operating nuclear powerplants to have one individual on the emergency response team responsible only for communicating with offsite emergency officials.

During our review, State and local officials were concerned about how to fund increases in the length of exercises and exercises held during non-duty hours. The Commission is

currently studying funding issues related to participation by State and local governments in emergency-response activities around nuclear powerplants. In establishing more effective test criteria, we believe the Commission also needs to determine the most appropriate mechanism for funding increased participation by State and local governments.

HAS THERE BEEN ANY CONSULTATION BETWEEN STATE AND LOCAL AUTHORITIES ON HANDLING NUCLEAR EMERGENCIES?

Considerable coordination and consultation exist among the State, Sacramento and San Joaquin Counties, and two nearby counties which could be affected by an accident at Rancho Seco. Moreover, emergency officials from each county appear well informed concerning their responsibilities during an accident, despite the absence of a formal plan in some cases.

Local jurisdictions, with or without a plan, will need State, and probably Federal, assistance to effectively respond to a nuclear powerplant accident with offsite releases. The more significant the offsite release, the more assistance will be needed. This is particularly true if radioactive releases require evacuation or other protective measures beyond the current 5-mile emergency planning zone.

State assistance capabilities

The most immediate, and probably long term, assistance will come from State agencies. State officials recognize this fact and have developed plans, alerting procedures, and communication systems to insure that activities in all affected counties will be coordinated. Also, the State has participated, on a limited basis, with the District and Sacramento County in emergency exercises. A complete test of the State's capabilities has not, however, been undertaken.

Areas where local jurisdictions will most likely need assistance include

--monitoring food pathway contamination,

--performing some radiological monitoring and interpretation functions,

--monitoring contamination to fish and wildlife,

--providing additional traffic control, and

--coordinating with Federal agencies.

With the exception of monitoring food pathway contamination, the State will probably be able to provide these services. Commission guidelines for State nuclear emergency plans require States to include methods for removing contaminated foodstuffs from the food chain, including identifying marketing channels in advance. State officials are apparently unaware of this provision and, consequently, no State plans have been prepared which cover this area. In fact, even though Federal and private sector assistance will be needed to insure that no contaminated food products are introduced into the market system, we found no plans or procedures at any level to insure effective implementation of this requirement.

Federal assistance capabilities

The State and local governments can request Federal assistance in a nuclear emergency through the Interagency Radiological Assistance Plan. Under this plan, the resources of 13 Federal agencies capable of varying degrees of radiological assistance can be used.

The Assistance Plan designates the Department of Energy as the agency responsible for directing the administration, implementation, and application of the Plan's provisions. The Department's San Francisco Operations Office is responsible for coordinating the regional assistance plan. In any major accident, however, Department headquarters would assume control and coordinate the Federal response.

No specific plans relating to Rancho Seco have been prepared by participating Federal agencies. Similarly, no drills to test the capabilities of Federal agencies have been performed recently, making it difficult to evaluate the adequacy of Federal emergency response capabilities. Although Federal officials believe they can effectively respond when called on, they agree that participating in drills can identify communications problems, test readiness capabilities, and help familiarize officials with each other's capabilities and roles in a possible accident.

We find it rather ironic that Federal agencies do not participate in drills while the utility, State, and local agencies are required, or at least encouraged, to prepare detailed plans and participate in drills. We believe Federal agencies need to develop site-specific procedures for responding to nuclear powerplant emergencies and periodically participate in drills and exercises with other offsite emergency organizations.

In our March 30, 1979, report, we pointed out that the Federal Emergency Management Agency was to be established by April 1, 1979, to consolidate diffuse Federal emergency-related organizations and serve as a focal point for all Federal emergency planning and preparedness activities. We also pointed out that the new agency would not automatically assume Federal nuclear emergency-response planning, policymaking and coordination functions unless it rescinded the prior delegation of these functions to the Nuclear Regulatory Commission.

In July 1979 the new agency became organizationally complete and also became a participant in the Interagency Radiological Assistance Plan. According to Department of Energy officials, participants in the Assistance Plan --including the new agency--will be reviewing and updating the Assistance Plan in the near future. One important item on the agenda, these officials said, is to decide whether the lead agency role should be transferred from the Department of Energy to the Federal Emergency Management Agency.

HAVE LOCAL RESIDENTS BEEN INFORMED OF EVACUATION PROCEDURES IN THE EVENT OF AN EMERGENCY?

As a result of the incident at Three Mile Island, the Sacramento Municipal Utility District sponsored several public meetings for residents living around the Rancho Seco nuclear powerplant. Prior to that incident, neither the utility nor State and local governments had held such public meetings or distributed emergency-related information, nor do they have any plans to periodically do so in the future. Also, the Commission has not required utilities to distribute emergency-related information to the public.

We believe that a serious weakness in assuring the overall preparedness of nuclear emergency-response planning results from the absence of some requirement for periodically providing the public information about the (1) potential hazards present at nuclear facilities such as Rancho Seco, (2) emergency responses required to cope with a nuclear emergency, and (3) protective measures that can be taken to minimize or avoid radiation exposure. This information could be provided in utility bills or through public meetings conducted by utilities and local emergency organizations.

The success of emergency preparedness at Rancho Seco depends to a large extent on public reaction to the infor-

mation and directions provided if a radiological release threatens public health and safety. Without some prior knowledge of what to expect and what to do in case of a Rancho Seco accident, the public may not react quickly or as cooperatively as the situation demands.

ASSUMING THE WORST POSSIBLE ACCIDENT, WOULD ALL THE AFFECTED AREAS HAVE ADEQUATE EMERGENCY PLANS?

We examined the implications of two serious accident scenarios for Rancho Seco. The first scenario describes the impact of a worst possible accident and the second describes the impact of the worst accident the Commission uses in licensing nuclear powerplants.

Our worst case accident scenario for Rancho Seco is that of a hypothetical melt-down of the reactor core, followed by the rupture of the reactor vessel and containment building, which releases substantial amounts of radioactive material to the environment. The amounts of radioactive material released to the environment for our scenario were based on considerations of the estimated amounts of radioactive materials present in the reactor core at Rancho Seco.

Many variables such as weather conditions, wind direction and speed, and topography of the area can affect the dispersion of radioactive material released to the environment from a nuclear accident. Worst meteorological conditions, based on data collected at the Rancho Seco site, were assumed to be present at the time of the hypothetical release.

Based on this scenario, the Commission calculated, at our request, the geographical boundaries of the areas which would require protective actions, if possible, under the Environmental Protection Agency's Protective Action Guides.

This calculation shows that persons within a wedge-shaped area of about 1,350 square miles will receive exposures in excess of the Protective Action Guides. This area is estimated to extend out to a distance of about 150 miles. All areas within a 150-mile radius of the plant should be used to estimate the affected area since wind direction cannot be predicted. Although the model used cannot provide accurate results for distances greater than about 50 miles, the 150-mile figure can be used as an upper limit since very conservative assumptions were used to make the calculations.

We also asked the Commission to calculate the area that would be affected by the worst accident--the design-basis accident--considered by the Commission in licensing nuclear powerplants. Based on this scenario and similar adverse meteorological conditions, the Commission showed that the areas requiring mandatory evacuation under the Protective Action Guides would be within a radial distance of about 5 miles from Rancho Seco.

State and local governments do not have emergency plans covering all of the areas which would be affected in the worst possible accident. Such an effort would require planning and coordinating efforts of 44 counties in California and several in Nevada, with an affected population of over 8 million people. Obviously, such a planning effort would involve significant administrative, financial, and technical difficulties.

While existing plans do cover the 5-mile radial area calculated in the second of our two accident scenarios, they do not cover the 10-mile radial protective zone recommended by the Commission/Environmental Protection Agency task force as a basis for emergency-response planning.

USE OF MODELING CAN IMPROVE EMERGENCY PREPAREDNESS

The Atmospheric Release Advisory Capability is a Department of Energy system developed at Lawrence Livermore Laboratory which can assess the effects of atmospheric radiological releases on surrounding locations. Sophisticated computer modeling of release data can be performed to predict the effects of radioactive releases. This system was originally developed to provide the Department of Energy with a better means of dealing with potential accidents at its own facilities. A growing interest, however, is being expressed in the role such a system can play in predicting radiological contamination from accidents at commercial nuclear facilities.

This system is a valuable tool for assessing the impacts of a radiological accident. It can process a tremendous amount of data and provide a real time perspective of contamination pathways. Maps and other data produced by the system can aid decisionmakers in efficiently deploying resources. For example, it can aid in determining (1) where to deploy radiological monitors, (2) evacuation routes,

and (3) probable areas where food contamination will be a problem. Additionally, such a system could improve emergency response planning and training efforts. According to Commission officials, the Laboratory's system is the most sophisticated such system now in existence.

State, county, and utility officials are enthusiastic about the system and believe it should be installed at Rancho Seco as soon as possible. At the Commission's request, the Lawrence Livermore Laboratory recently completed a detailed assessment of the feasibility of installing the system at Rancho Seco. According to Commission officials, Rancho Seco was selected because of its proximity to the Laboratory and the limited funds available for the assessment. The assessment shows that for an initial cost of $125,000 and an annual operating cost of about $10,000 the Livermore system can be made operational at Rancho Seco.

In view of the benefits identified in the Laboratory's study, and the small cost relative to the approximately $1 billion cost of building a nuclear powerplant, we believe the Commission should move rapidly to require the installation of the Laboratory's computer modeling system at Rancho Seco. In addition to improving emergency preparedness at Rancho Seco, this would provide the Commission with valuable cost and benefit data on the feasibility of installing such a system in nuclear powerplants nationwide.

CONCLUSIONS

While the probability of a significant radiological release from Rancho Seco may be remote, it nevertheless remains a possibility. There may be no advance warning of such an accident, and time for action could be short. For this reason, a high degree of planning and preparedness must exist among all the organizations charged with emergency responsibilities.

State and local officials believe their emergency-response plans are adequate to protect the population within 5 miles of the plant boundary--the current planning zone. If protective actions were necessary out to 10 miles, the jurisdictions involved may have considerably more difficulty insuring public safety. Neither local, State, nor Federal agencies have plans for protecting residents out to the 150-mile limit established in our worst accident scenario. Such an effort would require planning and coordination among 44 counties in California and several in Nevada, with an affected population of over 8 million people.

APPENDIX I

Although emergency planning for the worst possible accident is theoretically possible, the administrative, financial and technical difficulties involved would be significant. Furthermore, we believe the joint task force report recommending a 10-mile protective zone established a technically valid basis for offsite nuclear emergency response planning. Consequently, we continue to believe that the Commission should rapidly establish an emergency response planning zone of about 10 miles around all nuclear powerplants.

Only limited testing has been done for emergency response plans at Rancho Seco. While the Commission requires plant operators to conduct tests with offsite organizations at least once a year, this requirement does not stipulate how comprehensive the tests should be or who should participate. We believe comprehensive exercises need to be conducted periodically and the results carefully evaluated by the Commission to determine weaknesses in the emergency response effort.

Similarly, recent exercises indicate that communications problems exist between the plant operator and offsite officials. According to State and local officials, plant emergency operations take precedence over communication with offsite officials. We believe the Commission could eliminate this problem by requiring utilities operating nuclear powerplants to have one individual on the emergency-response team responsible only for communicating with offsite emergency officials.

Residents living near the Rancho Seco plant have not been routinely informed of the potential hazards or the appropriate response in case of an offsite radiological release. Because successful emergency response may depend on public reactions to the emergency situation, we believe residents around Rancho Seco should periodically be given such information.

No plans dealing specifically with Rancho Seco have been prepared by Federal agencies participating in the Interagency Radiological Assistance Plan. Furthermore, these agencies have not participated in drills to test their response capability. We believe Federal agencies need to develop comprehensive nuclear powerplant emergency plans and periodically participate in drills and exercises to test the effectiveness of these plans.

Finally, we believe the Commission should move rapidly to require the installation of the Lawrence Livermore Laboratory's computer modeling system at Rancho Seco for two reasons. First, use of such a system can enhance emergency response actions, serve to improve emergency planning efforts, and provide for more realistic exercises. Second, the Commission can use the cost and benefit data obtained from experience at Rancho Seco in determining if this or similar systems should be installed at nuclear powerplants nationwide.

In our previous report on nuclear emergency preparedness we reached some of the above conclusions based on reviews of emergency preparedness around other selected nuclear powerplants and emergency planning and preparedness information provided to us by State governments. In that report, we recommended that the Chairman, Nuclear Regulatory Commission:

--Allow nuclear powerplants to begin operation only where State and local emergency-response plans meet all of the Commission's essential planning elements.

--Require license applicants to make agreements with Federal, State, and local agencies assuring their full participation in annual emergency drills over the life of the facility.

--Establish an emergency-planning zone of about 10 miles around all nuclear powerplants as recommended by the Environmental Protection Agency/Nuclear Regulatory Commission task force, and require licensees to modify their emergency plans accordingly.

--Require that the people living near nuclear powerplants be provided with information about the potential hazard, the emergency actions planned, and what to do in the event of an accidental radiological release.

As a result of our recommendations and the Three Mile Island incident, the Commission is (1) reviewing its emergency planning and preparedness requirements and (2) considering adopting a wide range of additional emergency planning regulations. Full Commission implementation of the above recommendations, the recommendations in this report, and other changes the Commission is now considering, should measurably improve emergency preparedness around Rancho Seco and other nuclear powerplants.

RECOMMENDATIONS TO THE CHAIRMAN, NUCLEAR REGULATORY COMMISSION

In addition to implementing the recommendations in our March 30, 1979, report on nuclear emergency preparedness, we recommend that the Chairman, Nuclear Regulatory Commision:

--Establish criteria for exercising emergency-response plans which realistically test their effectiveness. This might include requiring longer exercises with involvement from all emergency-response agencies and stipulating that periodic exercises be held at night and on weekends. In developing this criteria, the Chairman should also consider the most appropriate method to defray increased costs incurred by State and local governments.

--Require that at least one member of the utility emergency-response team be assigned the sole responsibility of communicating with State and local emergency officials.

--Require the installation of the Atmospheric Release Advisory Capability computer modeling system at Rancho Seco to enhance emergency planning and preparedness around that powerplant and test the system for possible use nationwide.

--Determine the feasibility and desirability of requiring installation of atmospheric release computer modeling systems at nuclear powerplants nationwide.

RECOMMENDATIONS TO THE SECRETARY, DEPARTMENT OF ENERGY

The Federal agencies participating in the Interagency Radiological Assistance Plan will soon be revising and updating the plan. One item on their agenda is to decide whether or not lead agency responsibility should be transferred to the new Federal Emergency Management Agency. At the moment, however, the Secretary, Department of Energy, is the lead Federal agency official under the Assistance Plan. Therefore, we recommend that the Secretary of Energy, in conjunction with other participating Federal agencies,

--prepare site-specific procedures for responding to emergencies at nuclear powerplants, and

--periodically participate with other offsite agencies in emergency exercises around nuclear powerplants.

AGENCY COMMENTS AND OUR EVALUATION

We obtained comments on this report from the Nuclear Regulatory Commission, the Department of Energy, the Sacramento Municipal Utility District, the California Office of Emergency Services, Sacramento County, San Joaquin County, and the emergency coordinator of Amador and Calaveras Counties--counties which border on Sacramento and San Joaquin County. Written comments provided by the Utility District, the California Office of Emergency Services, and San Joaquin County are included as appendixes II, III, and IV, respectively. The other parties provided verbal comments which are discussed below.

Nuclear Regulatory Commission comments and our evaluation

With one exception, Commission officials generally agreed with our conclusions and recommendations. These officials pointed out that the Commission has begun preparing new emergency preparedness regulations which should respond to the recommendations in both this report and our March 30, 1979, report. Commission officials said the Commission currently (1) plans to complete the new regulations by January 1980 and (2) is considering a thorough review of nuclear emergency preparedness which should be completed by 1984.

Commission officials said that because of the number of nuclear powerplants operating and under construction and the costs associated with emergency-response exercises, Federal agencies should participate in nuclear powerplant emergency exercises once every 5 years.

Commission officials do not believe that Rancho Seco represents the best nuclear powerplant to test an emergency-response related computer modeling system, such as the system developed by the Lawrence Livermore Laboratory. They said they would prefer to select a powerplant with a higher surrounding population density--where the system would be of maximum benefit in the event of a real emergency--and a more

complex surrounding terrain--which would maximize the usefulness of test information. These officials acknowledged that selection of a powerplant other than Rancho Seco would add at least 6 months to the time required to install and begin testing the Laboratory's computer modeling system.

While we recognize the benefits Commission officials hope to attain by selecting another powerplant, we believe early installation and testing of an emergency-response related computer modeling system is important so the Commission can rapidly determine whether or not to require such systems nationwide. Therefore, we continue to believe the Commission should require the installation of the Atmospheric Release Advisory Capability system at Rancho Seco.

Department of Energy comments

Department of Energy officials commented only on the Federal assistance and atmospheric release computer modeling aspects of the report. These officials agreed that the Federal agencies participating in the Interagency Radiological Assistance Plan should participate to some degree--perhaps every 5 years as suggested by the Nuclear Regulatory Commission--in nuclear powerplant emergency exercises. They pointed out, however, that the Secretary, Department of Energy, cannot compel such participation from other participating agencies.

Department officials agreed that the Atmospheric Release Advisory Capability system could be tested and used at nuclear powerplants; but pointed out that many details --such as whether or not the Department's Lawrence Livermore Laboratory should have a role--need to be worked out.

Sacramento Municipal Utility District comments

The Utility District's comments pertained only to the clarity and accuracy of statements in our draft report. The Utility District said that responsibility for offsite communications is one of the first matters delegated by the plant emergency coordinator. We noted, however, that there is no guarantee that the individual delegated this offsite communications responsibility will be trained in the proper communications functions and procedures.

The Utility District also expressed concern over our discussion of the worst case accident, and stated that it cannot comment on the validity of the calculated affected

areas without reviewing the assumptions used in the calculations.

California Office of Emergency Services

The California Office of Emergency Services generally agreed with our conclusions and recommendations. The Office did, however, disagree with our statement that a complete test of the State's capabilities has not been undertaken, pointing out that parameters for a "complete test" have not been established. We continue to believe a complete test has not been undertaken, and have recommended in this report that the Commission establish more comprehensive test criteria. The Office also said that the report unduly emphasizes the worst possible accident at Rancho Seco and that accident's implications for emergency preparedness.

Other comments

San Joaquin County did not comment on our conclusions and recommendations, but pointed out it would need additional funding from non-county sources to finance nuclear emergency preparedness improvements.

The emergency coordinator of Amador and Calaveras Counties agreed with our conclusions and recommendations.

APPENDIX II

SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT □ 6201 S Street, Box 15830, Sacramento, California 95813; (916) 452-3211

September 10, 1979

Mr. Louis G. Roberts
U. S. General Accounting Office
1275 Market Street, Suite 900
San Francisco, CA 94103

Dear Mr. Roberts,

On August 30, 1979, you requested the staff of the Sacramento Municipal Utility District to review a draft report on emergency preparedness around the Rancho Seco nuclear power plant (EMD-79-103). Based on that request we are providing the following comments:

Page No.	Comments
3	The sentence "Such an accident, called a Design Base Accident, might result in limited releases of radioactive materials outside the boundaries of a nuclear power plant." should be deleted. It, in conjunction with the preceeding discussion of releases larger than a DBA, causes confusion on the part of the reader and does not contribute to the overall discussion.
4	The sentence "Furthermore, no other local jurisdictions nor Federal Government have participated in these exercises." fails to reflect the fact that:

1. The State Office of Emergency Services has participated either directly or indirectly in each of the annual exercises involving the Sacramento County Office of Emergency Operations.

2. The Department of Energy's radiological assistance team physically participated in a Rancho Seco drill in 1974.

3. The NRC Region V office is notified during major drills and participates via telephone communications back and forth throughout the duration of the simulated incident.

4. Annually, the local hospital (Sutter General Hospital) carries out, in conjunction with Rancho Seco, a full fledged medical contamination and over exposure drills at their facility.

GAO note: Page numbers in this letter have been changed to correspond to page numbers in the final report.

APPENDIX II

5 The sentence "First, all the exercises were held between 8 and 11 in the morning on regular workdays." does not reflect the following:

1. The DOE radiological assistance team drill in 1974 was conducted starting at 5 a.m. and was completed at approximately 1 p.m.

2. Quarterly Rancho Seco onsite drills have been conducted in off hours when minimum shift capability exists.

3. On more than one occasion, the Sacramento County Emergency Operations Office has exercised its internal emergency notification procedures during back shifts. Experience gained from these exercises has helped them understand the degree of delay in arrival of off duty personnel and what shortages in manpower and resources can be expected during such periods.

5 The sentence "This does not insure that plant personnel working during off shifts receive adequate emergency response experience nor does it allow State and local jurisdictions to test their ability to contact and assemble their shifts on a 24 hour basis." misrepresents what actually occurs. Beside the comments listed above, which directly address the subject, I would state that at Rancho Seco each shift of a minimum of 7 people is rotated to other shifts weekly. Records have been maintained on which shifts have been involved in emergency drills and efforts are made to assure that all shifts receive equal opportunity to face emergency drill situations. It should be noted that whether a drill itself is conducted during the day or on off shifts the procedures require the same basic type of response. While no changes in the procedures are necessary between daytime and off shift periods, it is recognized that there is a reduction in manpower and resources.

5 The sentences "The Rancho Seco Emergency Response plan designates the plant emergency coordinator as the person responsible for maintaining communications with State and local officials. This individual is also responsible for all emergency operations at the plant." misleads the reader by suggesting that the Emergency Coordinator has so many things under his responsibility, that a good job of offsite communications is not likely. Although the Rancho Seco Emergency plan itself is somewhat vague, in every drill conducted to date, the responsibility for communications is one of the first things delegated by the Emergency Coordinator to a plant operator. This individual is responsible for recommending which agencies should be contacted and filling out the information sheet and finally obtaining Emergency Coordinator

APPENDIX II

approval on both prior to initiating communications (see "Instructions" on page E-27 of the Plan).

5 The sentence "According to State and local officials, plant emergency operations take precedent over communications with offsite officials." is based on experiences that have occurred during drills. What has happened in most cases is that by the time the onsite emergency is gearing down and people are being reassigned for routine operational tasks, the Office of Emergency Services and the Emergency Operations Office are gearing up and are developing needs for additional information to carry out their portion of the scenario. This confusion has often resulted in a lack of continuity of information flow. In a real emergency, communications would be established and maintained and the flow of information would be more reliable and of higher quality than that encountered in past short duration drills.

8 The sentence "To date, no evacuation information has been distributed to residents living in the area around Rancho Seco." is not accurate. Within a short time frame after the Three Mile Island incident, members of the SMUD staff were conducting publicized meetings. The subject content of these meetings included:

1. A description of the Three Mile Island Accident scenario.
2. Rancho Seco design as it relates to Three Mile Island.
3. Public health aspects of the Three Mile Island Accident.
4. Emergency plans at Rancho Seco in the event of a major radiological accident including protective action (such as evacuation) in the 5 mile radius.
5. Worst case (class 9) accidents, the consequences and latest proposed government emergency plan guidance (NUREG 0396).

The specific dates and locations of where some of these meetings were held follows:

TMI and Emergency Plan Related Meetings

Date*	Location	Estimated Attendance
April 9	Herald	150
April 10	Galt	50
April 17	Wilton	200
April 18	Elk Grove	150
April 19	Sloughouse	150
May 1	Folsom	100

APPENDIX II

*These specific meetings involved a SMUD nuclear engineer and health physicist. In addition, SMUD has a Speakers Bureau which conducted over 50 talks to citizens groups in the Sacramento and Rancho Seco area during the period April - June 1979. Members of the Speakers Bureau had a working knowledge of the Rancho Seco and Offsite Response Agency Emergency Plans.

9 The entire discussion of the NRC conducting a Rancho Seco site specific class 9 accident analysis concerns us deeply. Without SMUD review of the assumptions and modeling used in generating such numbers, we cannot accept or support their use or reliability. This can also serve to confuse the public in light of guidance given in NUREG 0396.

10 The Rancho Seco Unit No. 1 Final Safety Analysis Report and related NRC Environmental Impact Statement does not support these latest calculations for a Rancho Seco design base accident. Again, without further explanation or SMUD review we cannot support the use or reliability of such numbers. Furthermore, the discussion suggests that existing emergency plans fail to meet even the Design Basis Accident for which they were written. This is of course not true.

We hope the above comments have been constructive and meaningful and that they will aid you in your final report.

Sincerely yours,

D. G. Raasch, Manager
Generation Engineering Department

APPENDIX III

STATE OF CALIFORNIA
EDMUND G. BROWN JR., Governor

OFFICE OF EMERGENCY SERVICES
POST OFFICE BOX 9577
SACRAMENTO, CALIFORNIA 95823
(916) 421-4990

September 6, 1979

Mr. H. J. D'Ambrogia
Assistant Regional Manager
U.S. General Accounting Office
Regional Office
1725 Market Street, Suite 900
San Francisco, CA 94103

Dear Mr. D'Ambrogia:

Thank you for the opportunity to review and comment on the draft of your proposed report to Congressman Matsui on emergency preparedness around the Rancho Seco nuclear power plant.

Detailed comments are attached, but I should like to point out that the present plans around Rancho Seco and all nuclear power plants in California have been developed consistent with the existing Nuclear Regulatory Commission criteria. We acknowledge that some changes are necessary as a result of the Three Mile Island incident. This is expressed in recommendations forwarded to Governor Brown on May 20, 1979 by the Nuclear Power Plan Emergency Review Panel of which I was a member (a copy of our recommendations is attached). However, to suddenly judge all existing plans and procedures on the basis of criteria which have not yet been accepted or even acknowledged by the Nuclear Regulatory Commission is unrealistic.

Furthermore, on several occasions in the Report you cite the worst-case accident at Rancho Seco and its impact on 44 counties in California and possibly affecting 8 million people. No actual scenario is defined and as far as we are concerned, the example has no relevance as a planning basis. Recognizing that it is included in the report because Mr. Matsui asked a specific question, we feel its implied importance to emergency planning is overstated by repetition. If you feel it should be included in the

APPENDIX III

Report then it should be put in perspective by describing the accident parameters, their associated probabilities and the implications for emergency planning.

Generally we are in accord with your findings and we commend you for your efforts. I trust our comments will be of assistance.

Sincerely,

Alex R Cunningham

ALEX R. CUNNINGHAM
Director

attachment

GAO note: The detailed comments attached to this letter are not included in this report, but were addressed in final preparation of the report.

APPENDIX IV

COUNTY OF SAN JOAQUIN
OFFICE OF EMERGENCY SERVICES
ROOM 401, COURTHOUSE
222 EAST WEBER AVENUE
STOCKTON, CALIFORNIA 95202
TELEPHONE (209) 944-2111

CLEO L. JANIW
COORDINATOR

September 5, 1979

Mr. Louis G. Roberts, Team Leader
U. S. General Accounting Office
Regional Office
Suite 900, 1275 Market Street
San Francisco, California 94103

REFERENCE:
301542

Dear Mr. Roberts:

Thank you for the opportunity to review your draft of the report to the Honorable Robert T. Matsui re Rancho Seco emergency preparedness plans.

My comments follow:

1. San Joaquin County is still waiting for an official determination of the evacuation radius around Rancho Seco before developing a comprehensive response plan. A radius change from 5 miles totally changes our planning approach.

2. Being primarily an agricultural area, we are also quite concerned that no plans have been developed for monitoring food pathway contamination. We need criteria and guidelines so we can plan to assist with this service.

3. Your report brought the problems into focus and it appears that once again Federal and State agencies have dumped the workload on the locals.

To achieve the high degree of planning and preparedness needed, we require additional funding from some source other than our County budget.

I would be interested in a copy of your final report when available. It was a pleasure to work with you.

Sincerely,

Cleo Janiw

Mrs. Cleo Janiw, Coordinator
Emergency Services

CJ/hld

APPENDIX V

ROBERT T. MATSUI
3RD DISTRICT, CALIFORNIA

COMMITTEE ON THE JUDICIARY
COMMITTEE ON GOVERNMENT OPERATIONS

Congress of the United States
House of Representatives
Washington, D.C. 20515

WASHINGTON OFFICE:
502 CANNON HOUSE OFFICE BUILDING
WASHINGTON, D.C. 20515
(202) 225-7163

DISTRICT OFFICE:
8058 FEDERAL BUILDING
650 CAPITOL MALL
SACRAMENTO, CALIFORNIA 95804
(916) 440-3543

April 24, 1979

The Honorable Elmer B. Staats
Comptroller General of the United States
General Accounting Office
Washington, D.C. 20548

Dear Mr. Staats:

As you may know, the Rancho Seco nuclear power plant in Sacramento is of Babcock & Wilcox design, similar to the Three Mile Island reactor which underwent a core meltdown last month.

Because of the gravity of the situation at Three Mile Island, and the potential for a similar accident at Rancho Seco --which also has a history of cooling system difficulties-- I am hereby asking the General Accounting Office to conduct a study of the emergency preparedness of the localities surrounding that plant.

Specifically, I would like the report to address the following areas of concern:

--What sort of evacuation plans have been prepared on state and local levels? Have any of them been tested?

--Has there been any consultation between state and local authorities on handling nuclear emergencies? Are local authorities aware of the role they would be asked to play in an emergency? Could local authorities handle an emergency on their own, or would they need to rely on state or federal assistance?

--Have local residents been informed of evacuation procedures in the event of an emergency?

--Assuming the worst possible accident under the worst meteorlogical conditions, would all the affected areas have adequate emergency plans?

APPENDIX V

Finally, I would like the GAO to recommend any changes or improvements they see as necessary for a comprehensive and feasable plan.

A possible generic defect in Babcock & Wilcox designed plants, NRC doubts about their safety, the history of cooling system difficulties at Rancho Seco, and the congested areas surrounding the plant call for a prompt investigation of the emergency preparedness of nearby localities. I would appreciate your giving priority to this matter.

Also, I wish this report for my use only, with a hold put on the public release of the report for thirty days after I receive it.

Thank you for your assistance.

Sincerely,

ROBERT T. MATSUI
Member of Congress

RTM:r

(301542)

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