

January 8, 1982

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

DOCKETED  
USNRC

'82 JAN 11 P12:13

Before the Atomic Safety and Licensing Board

In the Matter of )  
)  
THE CLEVELAND ELECTRIC )  
ILLUMINATING COMPANY, et al. )  
)  
(Perry Nuclear Power Plant, )  
Units 1 and 2 )

Docket Nos. 50-440  
50-441

APPLICANTS' ANSWER TO SUNFLOWER  
ALLIANCE MOTION FOR LEAVE TO  
FILE ADDITIONAL CONTENTION



In a motion dated December 18, 1981, Sunflower Alliance, et al. ("Sunflower") seeks leave to file a additional contention. The proposed contention states:

That the Applicant undertake to assure that the Perry Nuclear Power Plants control systems be upgraded, perhaps by making them redundant, so that no single failure in the system will cripple the control system.

Applicants oppose admission of Sunflower's proposed contention. It should be rejected as untimely. It should also be rejected for failing to meet the basis and specificity requirements of the Commission's regulations.

I. Sunflower Has Not Justified Admission Of Its Untimely Contention

Sunflower admits that its contention is untimely. Brief, p. 2. As a result, the contention can only be admitted based

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upon a consideration of the criteria specified in 10 CFR § 2.714 for late filings. The relevant case law has been summarized in prior filings<sup>1</sup> and need not be repeated here. It is clear that Sunflower has not adequately justified admission of the contention.

The most important factor in determining whether the contention should be admitted is intervenor's showing of good cause for the delay. Sunflower's showing is totally inadequate. Sunflower states that the issue of control systems' safety and reliability "has only recently been discovered", Brief p. 2, and refers to unidentified recent media reports, Brief, pp. 1, 3. Sunflower fails to identify when these revelations took place, whether the information in the recent media reports was something new, and whether the information has any bearing on the Perry plants. The most specific allegation provided by Sunflower is that the concern about control systems comes "[a]s a result of a recent failure at the Rancho Seco Nuclear Power Plant in Clay Station, California". Brief, p. 1. Sunflower does not specify what this "recent failure" was or when it occurred.

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1 "Applicants' Answer to Ohio Citizens for Responsible Energy Motion for Leave to File its Contention 15", dated December 7, 1981; "Applicants' Answer to Ohio Citizens for Responsible Energy Motion for Leave to File its Contention 16", dated December 7, 1981; "Response of NRC Staff to Motions of Ohio Citizens for Responsible Energy for Leave to File Contentions 15 and 16", dated December 11, 1981.

Applicants' research has found what appears to be the source of Sunflower's contention. The attached article from the December 6, 1981, New York Times uses language identical to that in Sunflower's filing.<sup>2</sup> The article identifies the "recent failure at the Rancho Seco Nuclear Power Plant" as a rapid shutdown of the reactor which occurred when a dropped light bulb caused short circuits in the control systems. However, that episode took place in March 1978, almost four years ago, and cannot conceivably be classified as new information. Even if Sunflower were to be excused for not being aware that this event has been common knowledge in the technical community for some time,<sup>3</sup> it cannot escape responsibility for information which appeared in the same sources that it now relies upon. For example, the New York Times two years ago

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2 The December 1981 New York Times article also discusses the possibility of a radiation embrittled reactor pressure vessel failing due to sudden thermal shock. This issue affects pressurized water reactors, not boiling water reactors such as Perry. See NRC Press Release 81-133, "NRC Staff Seeks Additional Information on Pressure Vessel Thermal Shock" (April 26, 1981); SECY-81-286 "Pressurized Thermal Shock" (May 4, 1981); NRC Staff Generic Letter 81-19, "Thermal Shock to Reactor Pressure Vessels" (April 20, 1981); Metropolitan Edison Company (Three Mile Island Nuclear Station, Unit 1), Partial Initial Decision, vol. 1, pp. 123-24 (December 14, 1981).

3 See e.g., NUREG-0667, "Transient Response of Babcock & Wilcox - Designed Reactors", Table B.2 (May 1980); SECY-81-286, "Pressurized Thermal Shock" (May 4, 1981); NRC Board Notification BN-81-06, "Thermal Shock to PWR Reactor Pressure Vessels" (May 8, 1981); Office of Nuclear Reactor Regulation, Generic Letter 81-28, "Steam Generation Overfill" (July 31, 1981). As is clear from the titles of these documents, the Rancho Seco occurrence is relevant to Babcock & Wilcox/pressurized water reactors.

discussed the Rancho Seco event in an article reporting a control system failure at the Crystal River facility, like Rancho Seco a Babcock & Wilcox reactor.<sup>4</sup> Reliance upon an event which occurred four years ago as good cause for a late contention seems at the least far-fetched. An intervenor should not be permitted to select only the most recent newspaper report of an episode which happened years ago and argue that it has somehow shown good cause.

Sunflower's Brief claims that the issue of safety and reliability of control systems "has only been recently discovered", that to its knowledge "there was no concern about the safety and reliability of the control systems in March of 1981", and that "to the best of the knowledge of your Intervenor, the issue has never been litigated." Brief, p. 3. The safety and reliability of control systems is not a new issue. In fact, a whole chapter of Applicants' Final Safety Analysis Report, more than 300 pages, is devoted to these systems. FSAR, chapter 7. The Staff's Standard Review Plan also includes detailed requirements for control systems. NUREG-0800, chapter 7. Nor is it accurate to state that the issue has never been litigated. In fact, the control system for the Rancho Seco facility itself has been litigated.<sup>5</sup> The

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4 A copy of this article, dated February 28, 1980, is attached.

5 Sacramento Municipal Utility District (Rancho Seco Nuclear Generating Station), LBP-81-12, 13 NRC 557, 568-573 (May 15,

same control system was also the subject of litigation with respect to Three Mile Island, Unit 1, like Rancho Seco also a Babcock & Wilcox plant.<sup>6</sup>

As a generic matter, the NRC is examining the safety implications of control systems. (As shown in Part II below, the mere existence of a generic issue is not enough to support admission of a contention.) In its August 12, 1980 letter to then Chairman Ahearne, the Advisory Committee on Reactor Safeguards suggested that control system reliability be considered an "Unresolved Safety Issue". In December, 1980 the Staff adopted Task A-47 as an "Unresolved Safety Issue". Task A-47 calls for the development of generic criteria to be used for plant-specific control systems reviews. See NUREG-0606, "Unresolved Safety Issues Summary", Vol. 3 No. 1 (February 13, 1981). NRC discussed the issue in its report to Congress in March 1981<sup>7</sup> as well as in its 1980 Annual Report.<sup>8</sup> The

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1981); see also Sacramento Municipal Utility District (Rancho Seco Nuclear Generating Station), ALAB-655, 14 NRC \_\_\_\_\_ (October 7, 1981).

6 Metropolitan Edison Co. (Three Mile Island Nuclear Station, Unit No. 1), Partial Initial Decision vol. 1, pp. 107-124. (December 14, 1981). The TMI decision also included a lengthy discussion of the more general issue of systems interaction. Id., pp. 198-216.

7 NUREG-0705, "Special Report to Congress: Identification of New Unresolved Safety Issues Relating to Nuclear Power Plants", pp. 11, A-9-11 (March 1981).

8 U.S. Nuclear Regulatory Commission, 1980 Annual Report, p. 45 (March 1981).

Advisory Committee on Reactor Safeguards discussed the issue at a number of public meetings during early 1981.<sup>9</sup> While it may be true that Sunflower has only recently learned about control systems, there is no basis for concluding that the control systems issue is new. Other intervenors have litigated control system issues as long as two years ago.<sup>10</sup> As noted above, the Rancho Seco episode of March 1978 had been in the newspapers well before the December 6, 1981 article apparently relied upon by Sunflower. An intervenor cannot blithely sit back and ignore information which has been both widely known and readily available until a newspaper article happens to catch its eye. Any other result would read the good cause requirement out of the regulations.

Nor has Sunflower made an adequate showing on the other balancing factors of 10 CFR § 2.714, particularly where its showing of good cause is so weak. As for other means to protect Sunflower's interest, the Staff's on-going generic

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<sup>9</sup> See 46 Fed. Reg. 1379 (January 6, 1981); 46 Fed. Reg. 7456, 7457 (January 23, 1981); 46 Fed. Reg. 10030 (January 30, 1981); 46 Fed. Reg. 12171 (February 12, 1981); 46 Fed. Reg. 13436 (February 20, 1981); 46 Fed. Reg. 13612 (February 23, 1981); 46 Fed. Reg. 16009 (March 10, 1981); 46 Fed. Reg. 19123, 19124 (March 27, 1981); 46 Fed. Reg. 20337, 20338 (April 3, 1981); 46 Fed. Reg. 22839, 22840 (April 21, 1981); 46 Fed. Reg. 24334 (April 30, 1981). The meetings took place on January 23, February 6, February 24-25, March 25, April 11 and May 7, 1981.

<sup>10</sup> The evidentiary hearings in Rancho Seco took place between February and May 1980. See LBP-81-12, 13 NRC at 566. The TMI hearings on control system issues took place in December 1980.

investigation is aimed at the overall concern which Sunflower appears to be addressing. And, as the Commission has observed, "parties are always free to bring to the attention of the Commission any matter within its jurisdiction." Pacific Gas and Electric Company (Diablo Canyon Nuclear Power Plant, Units 1 and 2), CLI-81-5, 13 NRC 361, 364 (1981). As to the third factor, assistance in developing a sound record, Sunflower has pointed to no particular knowledge or expertise relevant to the proposed contention. In fact, Sunflower's acknowledgement that its concern about control systems has only come about as a result of recent media reports belies any substantial familiarity with the subject matter. The fourth factor, representation of Sunflower's interest by other parties, favors admission of the contention but is far outweighed by the inadequate showing on the other factors. The final factor also cuts against Sunflower; any new contention necessarily broadens the issues. Whether or not it would delay the proceeding is speculative.

On balance, Applicants submit that Sunflower has failed to make an adequate showing to justify admission of its untimely contention.

II. The Proposed Contention Fails To Meet The Basis and Specificity Requirements of Section 2.714

The Commission's Rules of Practice require that a contention, to be admissible, must include a statement of its basis set forth with reasonable specificity. The Licensing Board has

provided an extended discussion of these requirements. Special Prehearing Conference Memorandum and Order, LBP-81-24, 14 NRC 175, 181-184 (July 28, 1981). Sunflower's proposed contention fails to meet these standards.

It must first be pointed out that the FSAR contains a long and detailed discussion of control systems. FSAR, Chapter 7. These three hundred plus pages analyze the Perry control systems, including their compliance with applicable General Design Criteria, IEEE Standards, and NRC Regulatory Guides. Sunflower's contention and the accompanying brief totally ignore this information. Instead, they focus on "a recent [sic] failure" at Rancho Seco, a pressurized water reactor manufactured by Babcock & Wilcox, which bears no apparent resemblance to the Perry facility or its control systems. Sunflower has shown no awareness of the Perry facility design, the relevance of the Rancho Seco episode to Perry, or any specific problems with the Perry control systems. The Licensing Board and the other parties are left to speculate on the relationship between the 1978 Rancho Seco event and this proceeding. In short, no nexus has been established.

The Appeal Board has explicitly addressed the admissibility of contentions in these circumstances. In Gulf States Utilities Co. (River Bend Station, Units 1 and 2), ALAB-444, 6 NRC 760 (1977), the State of Louisiana attempted to litigate a number of generic issues in the proceeding.<sup>11</sup> The Licensing

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<sup>11</sup> Although the State was a 10 CFR §2.715(c) participant rather than a 10 CFR §2.714 party, and its issues not technically con-

Board rejected the State's attempt, holding that no nexus had been shown between the generic issues and the particular facility. The Appeal Board agreed.

Given the generalized nature of the studies identified in the TSAR [Technical Safety Activities Report] and the status of regulatory guides, it was not erroneous for the Licensing Board to have imposed its nexus requirement. Unlike in [sic] the case of the SER, where the relationship to the facility is perforce established by its introduction into evidence in connection with the application, there is no necessary connection between the safety of a facility and any particular TSAR item or regulatory guide. Some connecting link must therefore be supplied.

The mere identification of a generic technical matter which is under further study by the staff (such as a TSAR item or Task Action Plan) does not fulfill this obligation, even if the matter has some patent relationship to the category of reactor under review. For as we have seen, the generic study may have little bearing on safety -- e.g., where it concerns the methodology of the staff's review. To establish the requisite nexus between the permit or license application and a TSAR item (or Task Action Plan), it must generally appear both (1) that the undertaken or contemplated project has safety significance insofar as the reactor under review is concerned; and (2) that the fashion in which the application deals with the matter in question is unsatisfactory, that because of the failure to consider a particular item there has been an insufficient assessment of a specified type of risk for the reactor, or that the short-term solution offered in application

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(continued)

tentions, the Appeal Board applied the same tests as if the party and contention rules applied. 6 NRC at 768, 772.

to a problem under staff study is inadequate. To bring newly issued regulatory guides into play, it would have to be shown, e.g., that the means adopted by the applicant (as reflected in the application) for satisfying a regulatory requirement are either not efficacious or significantly less satisfactory than those recommended in the guide.

6 NRC at 767 (footnote omitted). Absent such a showing of nexus, the proposed contention must be rejected.

The nexus requirement is particularly appropriate here. Sunflower relies on a failure in Babcock & Wilcox pressurized water reactor, not the General Electric boiling water reactors used at Perry. The Babcock & Wilcox design also uses a particular type of control system (the "Integrated Control System") peculiar to Babcock & Wilcox reactors.<sup>12</sup> Considering the substantial amount of information available to Sunflower, something more than a generalized reference to an unrelated incident at an unrelated facility is required. Nor can Sunflower take credit for the unsubstantiated, unsupported claim that "a failure in the control systems of the Perry Nuclear Power Plant could easily trigger an accident of the proportion of Three-Mile Island", Brief, p.2. Sunflower has simply provided no basis for the contention.

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12 See Sacramento Municipal Utility District (Rancho Seco Nuclear Generating Station, LBP-81-12, supra; Metropolitan Edison Co. (Three Mile Island Nuclear Station, Unit No. 1), Partial Initial Decision, supra.

III. Conclusion

Sunflower has not presented adequate reasons to justify admission of its untimely contention. Nor has it meet the tests established for contentions generally. Part of the problem may be Sunflower's apparent misconception of the role of the Licensing Board. Sunflower believes that

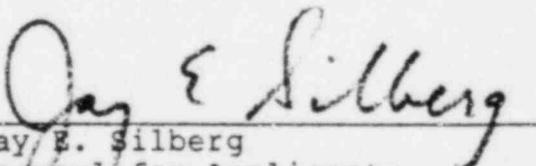
it is a mandatory requirement that the Atomic Safety and Licensing Board specifically find that the Perry Nuclear Power Plant can be operated in such a manner so as not to endanger the public health.

Brief, p. 4. Sunflower also cites to 10 CFR § 50.57(a)(3) for the proposition that the Licensing Board must make a finding on the overall safety of the facility before it can grant an operating license. Brief, p.2. At the operating license stage, the responsibility of the Licensing Board is, of course, to decide matters in controversy and those issues raised sua sponte. 10 CFR § 2.760a; 10 CFR § 2.104(c). The responsibility to make the findings required by § 50.57(a) is the Commission's. Within this regulatory framework, Sunflower must do more than cite to a four-year old event at an unrelated facility to warrant admission of a new contention at this stage of the proceedings.

Respectfully submitted,

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Dated: January 8, 1982

# Nuclear Accident Raises Doubt on Safety Margins

By MATTHEW J. WALD

An accident that began when a technician dropped a light bulb has raised serious questions in the minds of nuclear experts about their ability to estimate accurately the likelihood of a disastrous failure in many of the nation's nuclear power plants.

At issue are two factors that in combination could more easily lead to a disaster than either factor alone. They are engineers' uncertainty about the degree to which working reactors have been made brittle by years of neutron radiation, and their waning confidence in the ability of reactor control and safety systems to respond to a failure in the system.

The engineers have long known that radiation from the reactor core over years causes steel to become brittle. All steel is brittle when it is cold enough (30 degrees below zero Fahrenheit for ordinary structural steel, for example). Over the years, as the steel of which reactor pressure vessels are made absorbs neutron radiation, the temperature at which it turns brittle (the reference temperature) rises.

## Rate Included in Design

In building reactors, the predicted rate of embrittlement is included in the calculations. But estimates of the amount of radiation have risen recently, and engineers have learned that the use of traces of nickel and copper in the welds has made them more susceptible to radiation attack. The safety factors computed into the steel have been called into question as uncertainty has grown about the temperature at which brittleness sets in.

As long as the reactor is hot enough, operating normally at 550 degrees Fahrenheit under pressure of 2,200 pounds a square inch, there is little cause for concern, experts believe. But what if the

temperature falls while the pressure is high?

In a recent meeting with the Nuclear Regulatory Commission, one member of the commission's Advisory Committee on Reactor Safeguards, Myer Bender, said that the danger point might have already been reached, although he doubted it. He estimated that "two or three vessels" were especially prone to cracking because of metallurgical characteristics and design. "Unless you have looked at the system arrangement enough, and we have not," he said, "I do not think we are able to say for certain that they cannot be in trouble. I think my intuition says that they are not in trouble."

## Reactor Shut Down Abruptly

The discussion was prompted by the abrupt halting of the Rancho Seco nuclear plant in Clay Station, Calif., when a worker dropped a light bulb inside a control panel and the bulb itself caused short circuits in the control systems, which made the reactor shut down fast. In fact, it shut down so fast that, had the reactor been older, it is likely that the pressure would have cracked the walls. The result could have been loss of coolant, which would have allowed the fuel to heat up and melt into an uncontrollable mass.

The full consequences of a meltdown are little known, because there has never been one. But it is considered by engineers the worst thing that can go wrong. All reactor systems are designed to prevent a meltdown, not to deal with one.

Beyond the brittleness problem, the incident raises the issue of a whole class of systems whose vulnerability to short circuits and fires and earthquakes may be a safety hazard.

The systems are called "control systems," and they include monitoring

equipment, pumps and valves in critical parts of the plant. While "safety systems" must meet stringent requirements to withstand fire, earthquake, electric power failure and other challenges, control systems do not, because it is assumed that if they fail, the safety systems will take over.

## Some Doubt Validity of Distinction

Some engineers now believe, however, that the distinction is meaningless, because a failure of the control systems, such as occurred at Rancho Seco and at Three Mile Island, could lead to a serious accident.

According to Demetrios Basdekas, a safety engineer at the Nuclear Regulatory Commission, the safety systems do not create an "umbrella" of protection over the plant. "It turns out that the umbrella has a lot of holes," he said. The control and safety systems, he said, have a tendency to "successive, cascade failures," because they are interconnected. That is how a small disruption brought down so many systems at Rancho Seco, he said.

With a brittle reactor vessel, or in a newer plant, an earthquake or fire while the plant is running, he said, could cause the control systems to "go haywire," pumping water too fast or too slow, draining parts of the system that must be kept covered, or filling steam pipes with water, causing a rupture.

## Major Effort May Be Needed

Some other engineers are beginning to agree with Mr. Basdekas that a major effort may be required to upgrade control systems, perhaps making them redundant so that no single failure would cripple a system. "The industry, along with the commission, is learning that there is a lot more safety significance to nonsafety systems than we thought," said Roy Woods, who is in charge of the

commission's research on the probability of a low temperature-high pressure accident.

The commission staff now says it believes that the probability of a high-pressure and low-temperature combination is not so great that corrective action is warranted now but, according to a memorandum of Oct. 30 to the commissioners, it "may be required for some plants within a year."

As the commissioners have sought assurances about the margin of safety, nuclear experts have been hazy about the dangers. For example, at a joint meeting in October of the Nuclear Regulatory Commission and the Advisory Committee on Reactor Safeguards, Nunzio J. Palladino, the chairman of the commission, pressed members of the advisory committee for "any advice that we have a certain degree of confidence that we are right, even on the oldest plants, for a period of time."

## Dispute From Operator

At the other end of the argument are the licensees. Northeast Utilities, for example, has test data for its Connecticut Yankee plant, in Haddam Neck, Conn., showing that the reference temperature is 130 degrees, and will reach 150 degrees at the end of its life. The commission, using a different test, which Northeast Utilities says is too conservative, found the reference temperature to be 230 degrees already.

Staff members of the Nuclear Regulatory Commission acknowledge that the right conditions could cause a vessel to crack, but question their likelihood. "If you postulate more severe overcooling events, you can get to a point, corresponding with low probability, where you can predict failure," said Mr. Woods.

DO NOT FORGET THE NEEDIEST

## Reactor Mishap In '78 Is Likened To Florida Spill

### New Questions Arise Over Nuclear Plants' Design

By DAVID BURNHAM

Special to The New York Times

WASHINGTON, Feb. 27 — Officials of the Nuclear Regulatory Commission said today that an accident similar to the one that forced the emergency shutdown yesterday of a reactor in Florida had occurred two years ago at a California plant designed by the same company.

Harold K. Denton, head of Nuclear Reactor Regulation for the commission, said at a news conference that the instrument problems that arose at the Rancho Seco plant near Sacramento, Calif., in March 1978 had been under study for some time but that no specific corrections had been ordered for the Florida reactor as a result of the review.

Commission officials in Florida and in Washington reported today that the Crystal River reactor in Florida was safe after a loss of electrical power apparently led to the accidental spilling of 43,000 gallons of radioactive water into the reactor's containment building. They said no radiation escaped to the atmosphere.

Despite the assurances, Senator Gary Hart, Democrat of Colorado; Representative Morris K. Udall, Democrat of Arizona, and the Union of Concerned Scientists raised questions separately of whether the similarity in the accidents in Florida and California suggested that there might be some design flaw in the Babcock & Wilcox Company's plants.

John MacMillan, head of Babcock & Wilcox's nuclear power generation group, said there was "no basis at this point for shutting down or slowing down Babcock & Wilcox reactors."

The company has designed nine of the nation's 70 nuclear reactors, including the two at Three Mile Island in Pennsylvania, the scene of a serious accident last March.

#### Electrical System Failures

Mr. MacMillan added that the efficient handling of yesterday's emergency at the Crystal River reactor, 90 miles north of St. Petersburg, "clearly indicates that these plants can be operated with safety as far as the public is concerned."

The executive acknowledged, however, that the Florida and California emergencies had both been initiated by failures in the electrical system, which prompted the loss of power to some key instruments that monitor the reactor.

The Rancho Seco mishap received little public notice when it occurred but came under increased scrutiny after the Three Mile Island accident.

Senator Hart, who is chairman of the Senate Committee on Nuclear Regulation, said the parallels between the two accidents raised "disturbing questions" and that he intended to determine whether the commission now believed that Babcock & Wilcox plants should be operated below full capacity or shut down, until corrective actions have been taken or a study determines that such actions are not necessary.

Representative Udall, chairman of the House subcommittee on Energy and the Environment, raised similar questions in a letter sent to the commission more than three weeks ago. Citing a study by a commission staff member, Mr. Udall asked the commission whether it felt the plants with potential instrument problems should be operated at full power "while this matter is under review." He has not yet received a reply.

The Union of Concerned Scientists called on the commission "to immediately order all Babcock & Wilcox plants to cease operation until their safety can be assured."

UNITED STATES OF AMERICA

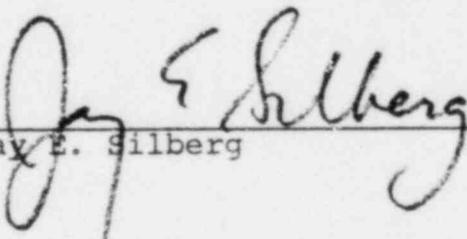
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CERTIFICATE OF SERVICE

This is to certify that copies of the foregoing  
"Applicants' Answer To Sunflower Alliance Motion For Leave  
To File Additional Contention", were served by deposit in the  
U.S. Mail, First Class, postage prepaid, this 8th day of  
January 1982, to all those on the attached Service List.

  
\_\_\_\_\_  
Jay E. Silberg

Dated: January 8, 1982

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