ENCLOSURE 4

DRAFT

TASK ACTION PLAN

(March 1983)

SYSTEMS INTERACTIONS IN NUCLEAR POWER PLANTS (TASK A-17)

Lead Organization:	Division of Safety Technology (DST) Reliability & Risk Assessment Branch (RRAB)
Task Manager:	F. Coffman, Leader Systems Interaction Section RRAB, DST
Lead Manager	A. Thadani, Chief, RRAB, DST
NRR Principal Reviewers:	E. Chelliah Systems Interaction Section, RRAB, DST
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Applicability:	Light Water Reactors (PWR and BWR) and Liquid Metal Fast Breeder Reactors
Projected Completion Date:	October 1984 September 1985, if current regulatory requirements must be changed.

1. DESCRIPTION OF PROBLEM

"Systems interaction" includes intersystems dependencies that jeopardize the designed action which a safety-related system was to perform. These include:

Functionally coupled systems interactions that result either from the sharing of components between systems or through physical connections between systems including electrical, hydraulic, pneumatic and mechanical.

Spatially coupled systems interactions that result from the proximity of systems to one another within the plant.

Induced-humanly coupled systems interactions where a plant malfunction or an error in the written procedures induces an operator action. Induced-humanly coupled systems interactions exclude random human errors and acts of sabotage.

The systems interaction program was initiated because design, construction, and operation of nuclear power plants involve many functional specialists (e.g., civil, electrical, mechanical, and nuclear engineers); and experience at operating plants has raised the question whether the work of these specialists is sufficiently integrated to enable them to minimize adverse interactions (dependencies) among systems that were designed to be independent. The objective of a systems interaction analysis is to provide assurance that

the independent functioning of a safety-related system is not jeopardized by preconditions that cause faults to be dependent. The adverse action of a safety-grade system caused by an influence from a nonsafety-grade system is expected to be a major consideration in such analyses.

Each systems interaction discovered would be analyzed deterministically to determine whether NRC's safety related requirements are met and whether the consequences exceed the plant's safety analysis. In parallel to the deterministic analyses, the staff plans to evaluate dependencies using probabilistic techniques, when applicable, to determine their risk significance. The probabilistic evaluation would aid in answering whether present PRAs comprehensively identify hidden dependencies. In summary, the initial systems interaction tasks are to develop an adequate and efficient methodology and to gain experience regarding its implementation, cost, and likely success.

The Crystal River-3 event of February 1980 exemplifies an adverse systems interaction. The reactor power, turbine control-valve position, and feedwater controls are functionally coupled to the integrated control system which depends upon the nonsafety-grade power supply buses. A single failure in one of the buses resulted in a stuck open PORV (a small LOCA) and failure of one high pressure injection flow indicator at midscale. An operator followed a correct procedure to balance HPI flow between the loops while he was unaware of the indicator's failure (an induced-humanly coupled systems interaction).

The Browns Ferry-1 fire exemplifies a spatially coupled systems interaction which resulted in closure of the main steam isolation valves and hindrance of the alternative supply of high pressure cooling water to remove decay heat.

Another example is the partial failure to scram at Browns Ferry 3, June 1980. Although the reactor protection system was part of the WASH-1400 PRA (pages II-514 to II-521), the simplified fault tree analysis had not discovered the functional coupling of both the scram discharge header vent valves and the scram instrument volume drain valves to a common reactor building equipment drain sump. Neither had the simplified fault tree analysis discovered the dependence of the scram related valves upon the slow degradation of instrument air.

The staff has confronted the systems interaction issue with various initiatives. In the past, the staff has endeavored to assure that all essential systems interfaces have been considered in the process of designing a LWR. Also, there has been focused attention upon specific events out of operating experience including the pivotal TMI-2 accident. Although some staff efforts are continuing from these specific initiatives, they are no longer the main thrust of the systems interaction program.

The NRC Action Plan Developed as a Result of the TMI-2 Accident (NUREG-0660) identified Action Item II.C.3 "to coordinate and expand ongoing staff work

on systems interaction (Unresolved Safety Issue USI A-17) so as to incorporate it into an integrated plan for addressing the broader question of systems reliability in conjunction with IREP and other efforts." The TMI-2 Action Plan also stated that "As these programs go forward, there will be a conscious effort to coordinate these activities, including possible combination of resources, to eliminate unnecessary duplication." The Division of Safety Technology has coordinated the ongoing work between the Generic Issues Branch and the Reliability and Risk Assessment Branch. In February 1983, the activities (primarily USI A-17 and TMI-2 Action Item II.C.3) were combined under the title of USI A-17 and placed under the purview of the Reliability and Risk Assessment Branch.

Presently, the systems interaction program objectives are both to resolve USI A-17 and to provide for adequate considerations of intersystems dependencies in present PRAs. The SRP is the principal document for guiding the evaluation of LWR designs against current regulatory requirements, which are mostly deterministic. To resolve A-17 is (a) to assess the adequacy of the SRP for completeness concerning systems interactions, and (b) to provide corrections to the SRP (and possibly Reg. Guides and regulations) that rectify any deficiencies in the present design, analysis, and review procedures which the assessment might discover.

2. PLAN FOR PROBLEM RESOLUTION

A. To Assess the SRP

To assess the adequacy of the SRP for completeness concerning systems interactions, we are considering past and current tests of the SRP plus any material information available from related efforts. The past tests of the SRP are: the Sandia National Laboratory analysis of Watts Bar-1 by Fault Trees (reported in NUREG/CR-1321), and the Diablo Canyon and San Onofre-3 (Spatially-coupled, seismically initiated) plans and searches (reported in NUREG-0675, Supplement 11 and NUREG-0712, Supplement 2).

The ongoing tests of the SRP are: PG&E is completing their evaluation of the systems interactions discovered during their searches of the Diablo Canyon units. We expected to review their evaluation of the results. Next, the PASNY study of IP-3 is proceeding using an analysis procedure developed by PASNY and its contractor. The acceptance criteria for the results from the PASNY study is their current licensing basis rather than the SRP. The staffs evaluation will need to add the inferences regarding the adequacy of the SRP. Next, Lawrence Livermore National Laboratory (LLNL) is completing its documentation and demonstration of the Digraph-Matrix procedure by an application to two modes of the high pressure coolant injection systems at Watts Bar-1. Any systems interactions discovered by LLNL will provide evidence of deficiencies in the SRP because Watts Bar-1 was reviewed

against the SRP. Finally, Consumers Power Company initiated a systems interaction program on Midland-2 (also a SRP plant). The staff has requested to review their program consistent with the licensing schedule although the review is not a licensing requirement.

The staff plans to apply the two leading candidate methods on Indian Point Unit-3. The project is to demonstrate the effectiveness of the methods in contrast with that method employed by PASNY. Each method will be applied by the respective laboratory that developed the method. The laboratories will be provided by PASNY with the same documents about Indian Point, Unit 3 that PASNY used in their study. Generally, these are the FSAR, the PRA, the Flow Diagrams, the plant arrangements drawings (elevations, plans, and sections), the Piping and Instrumentation Drawings, the Electrical Line Diagrams, the hangers, restraints, and snubbers sheets; and selected details drawings. Each laboratory will both search and evaluate Indian Point Unit 3 for single failures and paired failures that cause intersystems faults that jeopardize the independent functioning of safety systems.

Systems interaction analyses are very expensive (even limited ones would cost over $500,000 each). The staff's program to resolve the A-17 issue is now at the stage where the next step is an application of the known and documented methods. The application of these methods will provide a basis to answer the questions of the efficiency of a

specific methodology, (a) to discover intersystems dependencies hidden within the plant, (b) to rank-order intersystems dependencies that are safety significant, and (c) to establish the resource efficiency of the method from a safety-significant base.

By October 1984, the staff expects to complete a review of various systems interaction studies, assess the efficiency of the methodologies used in the studies, and to make a decision on the need for any requirement for plant specific systems interaction analyses. This expectation is based on the following:

1. Initiate Staff Methodology Comparison Study on IP-3 in April '83
2. Receive PASNY Methodology results in August '83
3. Receive Results of Staff Study on IP-3 in July '84
4. Develop Safety Significance of Identified Interactions in July '84
5. Develop Basis for new licensing requirements, if any, as a result of the A-17 program in October 1984.
6. (Conditional) Develop Regulatory Guide/Standard Review Plan Sections for separate systems interaction analyses in September 1985.

If the decision is that the SRP is adequate, then A-17 is resolved and the evaluation summarized by current SERs in response to the ALAB-444 decision becomes the confirmed NRC position. If the SRP is considered inadequate for systems interaction, then two actions will follow. First, a regulatory requirement will be developed adding an explicit systems interaction analysis for specific hazards and couplings. Second, a Regulatory Guide will be provided suggesting acceptable methods that can be relied upon to discover and evaluate adverse systems interactions. These methods include visual inspections, the PASNY methodology, the BNL FT/IFMEA, and the LLNL Digraph-Matrix Analysis. These two actions are "acceptance criteria" in the sense that their completion would constitute the alternative means toward resolving A-17.

B. To Provide for Systems Interactions in PRAs.

To provide for adequate considerations of systems interactions in present PRAs, three analysis procedures have been incorporated into the NREP Procedures Guide (NUREG/CR-2815)for use in the SEP Phase III/NREP effort. The procedures are those considered acceptable for the resolution of A-17, i.e., the BNL FT/IFMEA, the LLNL Digraph-Matrix Analysis and the PASNY methodology. If the SEP III/NREP effort proceeds, then the procedures will be applied to discover intersystems dependencies. The PRAs will allow the

staff to assess the risk importance of discovered systems interactions. Also this application will further demonstrate the efficacy of the different procedures against each other.

One of the results of the PASNY study of Indian Point Unit 3 is their risk assessment of some discovered systems interactions in the Auxiliary Feedwater System. PASNY is issuing a supplement to its PRA that will be reviewed toward determining the risk significance of systems interactions.

The discovered systems interactions can be either risk significant or not. If no risk significant systems interactions are discovered, then we could conclude that present PRAs adequately consider "common-cause failures", "common-mode failures" and hidden dependencies. If risk significant systems interactions are discovered, then we would endorse an effort to upgrade present PRAs by requiring the use of those methods which proved productive.

The current plan to resolve the systems interaction issue is tabulated below:

Effort	Product/Objective
Task 1. Diablo Canyon	1. Explicit analysis for a site specific hazard. Results show multiple conditional, spatial couplings among non-safety grade & safety-grade equipment. 2. This task will provide a spot check on the completeness of the SRP to discover safety significant intersystems dependencies.
Task 2. Matrix-Digraph Documentation	1. To document that method expected to most efficiently search for single and paired vulnerabilities of a plant.

Effort	Product/Objective
Task 3. Matrix-Digraph Demonstration	1. To demonstrate the feasibility of applying the matrix-digraph method to an LWR. 2. To provide for a comparison of the matrix-digraph method to the Sandia Lab Fault Tree method. 3. The task will provide a "spot check" on the completeness of the SRP on Watts Bar-1 to discover safety significant intersystems dependencies.
Task 4. PASNY Study of IP-3	1. To comply with the ACRS "request" for an explicit study of IP-3 for systems interactions that "might lead to significant degradation of safety." Emphasis was placed upon electrical, mechanical, and spatially coupled systems interactions. 2. To provide a spot check on the completeness of the SRP to discover safety significant intersystems dependencies.

Effort	Product/Objective
Task 5. Midland-2	1. Explicit analysis for a site specific hazard (tertiary process-heat coupling with chlorine plant). 2. To provide a spot check on the completeness of the SRP to discover safety significant intersystems dependencies.
Task 6. Methods Comparison on IP-3*	1. To demonstrate the effectiveness of two candidate methods in contrast with that method employed by PASNY. 2. To provide two checks on the adequacy of the current licensing basis for IP-3 concerning systems interactions. 3. Some of the discovered systems interactions will be evaluated for their risk significance.
Task 7. Methods Applications in SEP III/NREP*	1. To provide a basis for comparing among the feasible methods. 2. To determine the risk significance of discoverable systems interactions.

*Tasks 6 and 7 are not yet approved. They are proposed to expedite the resolution of USI A-17.

Effort	Product/Objective
Task 8. Develop Regulatory Guide/ SRP Section (Task 8 depends upon a decision that separate systems interaction analyses be required.)	1. To provide regulatory guidance on adequate methods to perform separate analyses for systems interaction. 2. To provide modifications to the Standard Review Plan that include the review of additional systems interaction analyses.

TABLE I

RRAB Funding and Staffing for Completion of USI A-17

(NRR Funding and Staffing is Summarized on Page 25)

		Total from FY80 thru 82		FY83		FY84		FY85	
		T/A ($K)	Staff (psy)	T/A ($K)	Staff (psy)	T/A ($K)	Staff (psy)	T/A ($K)	Staff (psy)
1.	Evaluation of Results from Diablo Canyon	2	1.5	-	0.2	-	0.2	-	-
2.	Documentation of Digraph-Matrix Method	100	0.1	-	0.1	-	-	-	-
3.	Limited Demonstration of Digraph-Matrix on Watts Bar-1	50	0.1	250	0.2	-	-	-	-
4.	Evaluation of PASNY Study of IP-3[a]	283	.4	150	0.8	50	0.3	-	-
5.	Evaluation of CPCo Study of Midland-2	-	-	80	0.4	-	0.4	-	-
6.	Methods Application[c] on IP-3	-	-	1200	1.5	1400	1.5	-	1.0
7.	Methods Application in SEP III/NREP[b,c]	-	-	-	-	350	0.5	150	0.2
8.	Develop Reg. Guide/ SRP Sections[d]	-	-	-	-	-	-	100	0.5

(a) Task 4 would be reduced in FY83 and FY84 by a total of $200K and 0.5psy if Task 6 is accomplished.

(b) Task 7 would be reduced by a total of $300K and 0.4psy if Task 6 is accomplished.

(c) Tasks 6 and 7 are not yet approved. They are proposed to expedite the resolution of USI A-17.

(d) Task 8 is dependent upon a decision to require separate systems interaction analyses.

3. BASIS FOR CONTINUED OPERATION OR LICENSING PENDING COMPLETION OF THE PROGRAM

Although the occurrence of events at LWRs that adversely affect safety systems redundancy justifies the present program on systems interactions. NRR continues in the confidence that current regulatory requirements and procedures provide an adequate degree of public health and safety.

Most applicants have not described a comprehensive program that separately evalutes all structures, systems, and components important to safety for the three categories of adverse systems interactions, that is, spatially coupled, functionally coupled, and humanly coupled. However, there is assurance that LWRs can be operated without endangering the health and safety of the public. Each application was evaluated against licensing requirements that were founded on the principle of defense-in-depth. Adherence to this principle results in requirements such as physical separation and independence of redundant safety systems, and protection against hazards such as high-energy line ruptures (Section 3.6.1 of NUREG-0800), missiles (Sections 3.5.1 and 3.5.2), high winds (Section 3.3), flooding (Sections 3.4, 3.5, & 3.6), seismic events (Sections 3.2.1, 3.4, & 3.9.2), and fires (Section 9.5.1). Current design provisions are subject to review against the Standard Review Plan (NUREG-0800) which requires interdisciplinary reviews of safety-grade equipment and addresses different types of potential systems interactions. Also, the quality assurance program that is followed during the design, construction, and operational

phases for a plant contributes to the prevention of introducing adverse systems interactions. Thus, the licensing procedure can provide for an adequate degree of plant safety.

Random human errors and acts of sabotage are outside the scope of the systems interaction program although they are evaluated by the NRC.

As part of the resolution of Unresolved Safety Issue A-17, the staff will determine whether presently licensed LWRs must have further analyses performed for adverse systems interactions.

4. NRC TECHNICAL ORGANIZATIONS INVOLVED

A. Division of Licensing (DL)

Division of Licensing support is needed to continue the coordination with the participating utilities and to enlist the cooperation of the utilities to be involved in the pilot demonstrations. The utilities' cooperation is needed to provide the detailed information used in a systems interactions analysis. The needed information includes engineering P&IDs, systems flow diagrams and manuals, electrical drawings, instrumentation and control drawings, plant procedures, and selected reports. DL will provide assistance to the Task Manager for setting up and coordinating with the utility personnel, informational meetings, documentation requests, and site visits that may be necessary. DL will also provide assistance to the Task Manager for integrating

any relevant experience and any new requirements resulting from the activities identified in Task A-17. DL will contribute to the review and approval of any licensing requirements and guidelines developed as a result of this USI, and will provide review and comment on the technical evaluations provided by the Task Manager.

Manpower Requirements

	Total	FY83	FY84	FY85
Operating Reactors Branch No. 1	0.25 psy*	.1	.1	.05
Licensing Branch No. 1	.15 psy	.05	.05	.05
Licensing Branch No. 4	.25 psy	.1	.1	.05
Licensing Branch No. 3	.10 psy	.05	.05	-

B. Division of Systems Integration (DSI)

DSI will provide review and comment on technical evaluations provided by the Task Manager in the areas of instrumentation and control, electrical power, the reactor systems and auxiliary systems designs,

*Assumed 1 professional staff year = 40 man weeks.

and accident analysis. The Instrumentation and Control Systems Branch and the Power Systems Branch will provide assistance for the purpose of integrating relevant experience and any new requirements and guidelines stemming from the completion of the tasks described in Task A-17. The Reactor Systems Branch and the Auxiliary Systems Branch will assist in the development of the selection criteria to be used for establishing safety significance of discovered systems interactions. A large portion of the ASB support will be determining the safety significance of systems interactions discovered at IP-3 on the AFW systems. In addition DSI will contribute to the formulation, review and approval of the recommendations, and guidelines developed at the completion of the tasks (described in Task A-17). DSI will also review and comment on the draft and final NUREG Report.

Manpower Requirements

	Total	FY83	FY84	FY85
Instrumentation and Control Systems Branch	.3 psy	.1	.1	.1
Power Systems Branch	.15 psy	.05	.05	.05
Reactor Systems Branch	.3 psy	.1	.1	.1
Auxiliary Systems Branch	.7 psy	.3	.3	.1

C. Division of Engineering (DE)

DE will provide review and comment on technical evaluations provided by the Task Manager in the areas of (a) the qualification of equipment against spatially coupled hazards (e.g., impulse loads radiation, temperature, pressure, and moisture), (b) the compatibility of fire detection and mitigation equipment with safety-related equipment including the adverse effects of inadvertent actuation, (c) High Energy Line Breaks and their consequential effects on control systems and safety-related equipment, and (d) generated missiles. The Equipment Qualifications Branch will provide support to establish the hostile-environment functionability of equipment identified to be within the spatial domain of a hazard generated as part of a postulated systems interaction scenario. The Chemical Engineering Branch will provide coordination with RRAB/DST for completeness to assure that fire protection equipment intended actuation, inadvertent actuation, or failure does not generate adverse systems interactions that are safety significant. The Mechanical Engineering Branch will provide coordination with RRAB/DST for completeness to assure that the consequences of High Energy Line Breaks have been bounded in the safety analysis. The Structural Engineering Branch will provide coordination with RRAB/DST for completeness to assure that all sources of missiles and safety-related equipment that could be impacted by missiles were analyzed.

The work being done under Task A-17 does not replace the responsibilities assigned to the Branches nor is the work intended to duplicate their responsibilities. The support identified here is to assure completeness of the Standard Review Plan against all aspects of the issue identified as sytems interactions.

Manpower-Requirements

	Total	FY83	FY84	FY85
Equipment Qualtification Branch	.15 psy	.05	.05	.05
Chemical Engineering Branch	.15 psy	.05	.05	.05
Mechanical Engineering Branch	.15 psy	.05	.05	.05
Structural Engineering Branch	.15 psy	.05	.05	.05

D. Division of Human Factors Safety (DHFS)

DHFS will provide review and comments on those technical evaluations involving man/machine interfaces. DHFS will contribute to the formulation, review and approval of recommendations and guidelines involving man/machine interfaces developed at the completion of the tasks. In this area DHFS will contribute in the development of maintenance or testing requirements (if warranted) for non-safety control systems.

Manpower Requirements

	Total	FY83	FY84	FY85
Human Factors Engineering Branch	.25 psy	0.5	0.1	.1
Procedures and Test Review Branch	.25 psy	0.5	0.1	.1

E. Division of Safety Technology (DST)

DST will provide overall management of the program to resolve this USI. Provides liaison between NRR and RES and provides coordination of activities performed within NRR which are part of this Task Action Plan. DST has primary responsibility for the review of the draft recommendations and guidelines and for coordination of the internal

management and the public review process required to adopt the recommendations and guidelines into licensing requirements. DST will provide review, comment and technical support on those issues/evaluations provided by the Task Manager involving reliability and risk assessments, and cost/benefit assessments related to systems interactions.

DST will provide assistance to the Task Manager for the purpose of integrating relevant experience and any new requirements stemming from the completion of those activities related to Task A-17 for which DST has responsibility. Those activities include GIB Tasks A-44, Task A-47, and Task A-49 activities relevant to this plan.

In addition, RRAB will provide for the risk assessments of systems interactions that have been selected as safety significant. The Safety Program Evaluation Branch will provide technical support on the cost/benefit evaluations associated with the recommendations and positions developed on each task. DST will also coordinate the writing and publication of the NUREG report and coordinate the issuance of other licensing documents such as Regulatory Guides and the Standard Review Plan with the Division of Engineering Technology.

Manpower Requirements

	Total	FY83	FY84	FY85
Generic Issues Branch	.15 psy	.05	05	.05
Reliability and Risk Assessment Branch	7.8 psy	3.2	2.9	1.7
Safety Program Evaluation Branch	.4 psy	.05	.3	.05
Research & Standards Coordination Branch	.15 psy	.05	.05	.05

F. Office of Analysis and Evaluation of Operational Data (AEOD)

AEOD will provide review and comments on the technical evaluations provided by the Task Manager, AEOD will provide assistance to the formulation, review and comment of the recommendations and guidelines developed (primarily on subtask 1). AEOD will also provide assistance to the Task Manager for the purpose of integrating relevant experience for which AEOD has responsibility.

Manpower Requirements

	Total	FY83	FY84	FY85
Plant Systems Unit	.2 psy	.10	.05	.05

NRC Resource Requirements Summary

		FY83	FY84	FY85
Contract Dollars for Technical Assistance (in thousands)*		$1,680	$1,800	$250
NRR Manpower (in professional staff years)				
DL	ORB1	.1	.1	.05
	LB1	.05	.05	.05
	LB3	.05	.05	-
	LB4	.1	.1	.05
DSI	ICSB	.1	.1	.1
	PSB	.05	.05	.05
	RSB	.1	.1	.1
	ASB	.3	.3	.1
DE	EQB	.05	.05	.05
	CHEB	.05	.05	.05
	MEB	.05	.05	.05
	SEB	.05	.05	.05
DHFS	HFEB	.05	.1	.1
	PTRB	.05	.1	.1
DST	GIB	.05	.05	.05
	RRAB*	3.2	2.9	1.7
	SPEB	.05	.05	.05
	RSCB	.05	.05	.05
AEOD	PSU	.1	.05	.05

*The itemization of RRAB resources is given by Task in the Table on Page 15.

7. INTERACTIONS WITH OUTSIDE ORGANIZATIONS

The staff will continue to maintain active interfaces with outside organizations. We have met annually with the AIF Subcommittee on Systems Interaction. There have been discussions with NSSS vendors, applicants, and licensees on many occasions during the course of regular safety-review activities, particuarly those outside organizations involved in the systems interaction program tasks described in section 2.

The program has benefited from a broad base of interactions with outside organizations due to our use of four national laboratories in the program: Brookhaven National Laboratories, Livermore National Laboratories, Pacific Northwest Laboratories, and Sandia National Laboratory.

The ACRS has continually pursued operating problems which it named systems interaction and has followed the progression of the systems interaction program. The ACRS interests led to meetings and memoranda and should be expected to lead to active interfaces between the staff and the ACRS. The activities of Task A-17 is scheduled to allow for keeping the ACRS informed of the program.

Additionally, informal exchanges have occurred with British and French individuals concerning their efforts on systems interactions. We are coordinating with the Office of International Programs to supplement our interactions with other nations.

The cooperation of selected utilities is necessary for the resolution of of USI A-17. Utility cooperation is needed to provide the detailed information used in a systems interaction analysis on a plant. The needed information includes engineering P&IDs, systems flow diagrams and manuals, electrical line drawings, instrumentation and control drawings, plant procedures, and selected reports. In addition, utility cooperation is needed for informational meetings and site visits. The incremental utility resources needed to provide this support is estimated as follows:

Estimated* Incremental Utility Resources to Support USI A-17

Task	Utility	Plant	FY83	FY84	FY85
1.	PG&E	Diablo Canyon	.05 psy	.1 psy	-
2.	N/A	-	-	-	-
3.	TVA	Watts Bar-1	.05 psy	-	-
4.	PASNY	Indian Point-3	.2 psy	.2 psy	-
5.	CPCo	Midland-2	.2 psy	.1 psy	-
6.	PASNY	Indian Point-3	.3 psy	.2 psy	.1 psy
7.	N/A	-	-	-	-

*RRAB estimated these resources based upon current experience.

8. POTENTIAL PROBLEMS

A. A systems interaction analysis is basically a search process for hidden safety problems at a nuclear power plant. It is not an effort to engineer the solution to a well defined safety problem. Thusly, there is a basic reluctance to search for more problems as if a sufficient number of problems do not exist already. The programmatic question becomes: "How do we know when to stop searching?" The answer appears to be that the search stops at the end of a predefined, systematic procedure regardless of the discoveries. We must have confidence in the search procedure that was employed. The A-17 Task Action Plan includes an effort to develop confidence in the procedure to be used. The procedures have been developed to the point where there is now the need to demonstrate the procedures at an LWR.

B. The cost of performing a systems interaction analysis is a potential problem. The analysis should be performed on the entire plant to not preclude the discovery of any intersystems dependencies. The analysis should be performed to the level of detail that would assure no hidden dependencies from supporting equipment. Both of the constraints on the analysis (broad scope and sufficient detail) contributes to the large costs of performing a systems interaction analysis. The decision to incur a large cost for the purpose of

searching for adverse systems interactions is a potential problem in itself.

C. The need for detailed information about the plant creates a potential for a third problem. The utility is the organization possessing the needed detailed information. Considering that a requirement to perform a systems interaction analysis does not exist, the progress of the program will be depend upon voluntary cooperation from the involved utilities.

FROM	ACTION CONTROL	DATES	CONTROL NO.
Rep. Thomas J. Downey	COMPL DEADLINE	3/14/83	12844
			DATE OF DOCUMENT
	INTERIM REPLY	B/D [illegible] 3/16/83	2/14/83
TO			PREPARE FOR SIGNATURE OF
Chairman Palladino	FINAL REPLY		☐ CHAIRMAN
	FILE LOCATION		☒ EXECUTIVE DIRECTOR
			OTHER

DESCRIPTION ☒ LETTER ☐ MEMO ☐ REPORT ☐ OTHER

Q's ~~cp~~ concerning safety of the Shoreham Nuclear Power Plant

SPECIAL INSTRUCTIONS OR REMARKS

PRIORITY

SECY-83-1501

ASSIGNED TO	DATE	INFORMATION ROUTING
Denton, NPR	2/28/83	Dircks Case/Denton
Speis	3/1/83	Roe 1. PPAS
[illegible]	3/1/83	Rehm 2. Eiesenhut
		Stello 3. Mattson
		DeYoung 4. Vollmer
		Haynes 5. Thompson
		GCunningham 6. Grace
		LUnderwood 7. Snyder

NRC FORM 232 (6-80)

EXECUTIVE DIRECTOR FOR OPERATIONS
PRINCIPAL CORRESPONDENCE CONTROL

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No. 83 1501 Logging Date 2/23/83

NRC SECRETARIAT

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- XXXX Exec. Dir./Oper.
- ☐ Cong. Liaison
- ☐ Public Affairs
- ☐ ____
- ☐ Gen. Counsel
- ☐ Solicitor
- ☐ Secretary
- ☐ Inspector & Auditor
- ☐ Policy Evaluation

Incoming: Rep Thomas Downey

From: ____

To: Palladino Date 2/14/83

Subject: req info re James Conran's position as it relate to safety related issues of the Shoreham Nuc plant

XX ☒ Prepare reply for signature of:

- ☐ Chairman
- ☐ Commissioner ____
- XXXX ☒ EDO, GC, CL, SOL, PA, SECY, IA, PE
- ☐ Signature block omitted

Date due: Mar 4 9

- ☐ ____
- ☐ Return original of incoming with response

- ☐ For direct reply*
- ☐ For appropriate action
- ☐ For information

Routed Off. EDO
Date 2-28-83
Time 2:52 p

Remarks: OCA to Ack, docket, RF

For the Commission: bac

*Send three (3) copies of reply to Secy Correspondence and Records Branch

NRC FORM 62A (3-82) ACTION SLIP