

U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Report/License No.: 95-18/DRP-35

Licensee: Boston Edison Company
RFD #1, Rocky Hill Road
Plymouth, Massachusetts

Facility Name: Pilgrim Nuclear Power Station

Inspection At: Plymouth, Massachusetts

Inspection Conducted: August 28-31, 1995

Inspectors: David Silk
J. Lusher, Emergency Preparedness Specialist
D. Silk, Senior Emergency Preparedness Specialist

Approved by: R. Keamig FOR
R. Keamig, Chief
Emergency Preparedness Section
Division of Radiation Safety and Safeguards

Areas Inspected: Pilgrim Nuclear Power Station Emergency Preparedness (EP) program changes; Emergency Plan (E-Plan) and Emergency Plan Implementing Procedures (EIPs); emergency response facilities, equipment, instrumentation, and supplies; organization and management control; training; independent internal reviews and audits; effectiveness of licensee controls; and communications capabilities.

Results: The inspectors concluded that all areas of the Pilgrim EP program were being effectively administered and implemented. No safety concerns or violations were identified.

DETAILS

1.0 PERSONS CONTACTED

Boston Edison Company

- * N. Desmond, Deputy Engineering Manager
- * L. Calfa, Senior Quality Assurance Engineer
- # D. Ellis, Acting Compliance Supervisor
- * F. Famulari, Quality Assurance Department Manager
- ** R. Markovich, Acting Regulatory Affairs and Emergency Preparedness Department Manager
- ** M. Medakovich, Nuclear Training Specialist
- ** J. Morlino, Facilities and Equipment Supervisor
- * H. Oheim, Nuclear Engineering Services Manager
- ** L. Oliver, Vice President and Station Director
- ** K. Perito, Professional Training Supervisor
- ** D. Perry, Emergency Planner, Health Physics
- # W. Riggs, Deputy Plant Manager
- ** W. Rothert, General Manager, Technical
- * A. Shiever, Regulatory Affairs Division Manager
- ** J. Spangler, Onsite Emergency Preparedness Division Manager
- ** G. Vazquez, Emergency Planner
- ** B. Yetman, Acting Offsite Emergency Preparedness Division Manager

Nuclear Regulatory Commission

- ** B. Korona, Resident Inspector
- ** D. Silk, Senior Emergency Preparedness Specialist

- # Denotes attendance at entrance meeting August 28, 1995
- * Denotes attendance at exit meeting August 31, 1995

The inspectors also interviewed and observed other licensee personnel during the course of the inspection.

2.0 EMERGENCY PLAN (E-PLAN) AND IMPLEMENTING PROCEDURES (EPIPS)

The inspectors reviewed E-Plan revisions 14 and 15 and fourteen EPIPs (See Attachment I for listing) and determined that there was no reduction in effectiveness of the E-Plan or EPIPs.

The inspectors determined that the licensee had good administrative procedures to govern the day-to-day activities of the EP department effectively. Examples included procedures to verify and update the Emergency Telephone Directory quarterly, to check the depth of the Emergency Response Organization (ERO) positions quarterly, and to check ERO requalification training status monthly. One administrative procedure contained a matrix that listed the EPIPs and the associated ERO personnel who utilize those procedures, to facilitate training needs. Also, at the end of the administrative procedures, there were listings of documents or commitments and the corresponding portion of

that procedure which provided a reference for the evolution of the procedure. The inspectors determined that the administrative procedures were very useful in implementation of the EP program.

3.0 EMERGENCY FACILITIES, EQUIPMENT, INSTRUMENTATION AND SUPPLIES

On August 30, 1995, the inspectors toured the Operational Support Center (OSC), Technical Support Center (TSC), and the Emergency Operations Facility (EOF) to check for operational readiness. The facilities were found to be in good condition and operationally ready.

However, when looking into the OSC equipment lockers, the inspector found three Mine Safety Appliance (MSA) iodine cartridges for MSA full-face respirators that had exceeded their expiration date. The expiration date stamped on the iodine cartridge was 7/95. The out-dated iodine cartridges were replaced immediately. However, during an interview with the lead auditor, who was conducting the NRC required 1995 annual audit (10 CFR 50.54(t) audit) of the EP program, the inspector found that the same out-dated iodine cartridges had been identified by a Senior Quality Assurance (QA) Engineer, who was auditing the facilities on August 22, 1995.

The inspector requested an explanation of why the iodine cartridges had been previously identified but not replaced.

The inspector was provided with the following information:

- On August 22, 1995, as part of the 10 CFR 50.54(t) audit conducted by the station QA, respiratory cartridges in the OSC cabinet and several other minor discrepancies were identified. This was identified by a Boston Edison Company (BECO) Senior QA Engineer and a Health Physics (HP) Technician.
- On August 22, 1995, the HP Technician informed the desk HP Supervisor that minor discrepancies had been identified by QA and that the auditor wanted to speak with the supervisor responsible for the inventory. Knowing that the responsible supervisor was on vacation, the desk supervisor attempted to contact the QA auditor himself. However, the desk supervisor left for the day before he was able to speak with the auditor. Later, the auditor went to the HP office and spoke to another supervisor who indicated that he was not the individual who handled this part of the program, and was referred to the responsible supervisor.
- On August 23-25, 1995, the focus of the Emergency Preparedness audit was at off-site facilities. The QA auditor was unable to discuss the discrepancies with the responsible supervisor.

- On August 29, 1995, upon returning to PNPS, the QA auditor provided a list of the discrepancies to the Radiological Operations Division Manager. Due to the low safety significance of the expired iodine cartridges, the manager focused on identifying the cause of the problem rather than on actually replacing the iodine cartridges.
- On August 31, 1995, a review of the HP surveillance procedure 5.8.2 by the NRC inspector and the licensee found that sufficient guidance was not provided for checking the iodine cartridges.

On August 31, 1995, during the NRC exit meeting, the licensee committed to revise the HP surveillance procedure 5.8.2 to provide additional guidance and, when identified, to correct the root cause of the problem.

Additionally, the licensee was in the process of performing a root cause analysis to determine further corrective actions to prevent recurrence. The NRC will review the issue during a future inspection (IFI 50-293/95-18-01).

The inspectors found the facilities to be effectively maintained.

4.0 ORGANIZATION AND MANAGEMENT CONTROL

The inspectors interviewed several licensee personnel, reviewed the organizational structure and portions of various administrative procedures to assess the adequacy of the licensee's EP department and emergency response organization.

The licensee's EP department had experienced a few minor changes since the last EP program inspection (July 1994). Those changes were in the Offsite EP Division. The Offsite EP Division Manager was designated as the Acting, Regulatory Affairs and EP Department (RAEPD) Manager. This individual was knowledgeable of EP issues since he was previously the Offsite EP Division Manager. An individual who was in the Offsite EP Division was then named the Manager of that division. Additionally, two (of six) Offsite Planners retired and were not replaced. No adverse impact from the changes was identified by the inspectors.

Since the last inspection, the Onsite EP Manager did not acquire any collateral duties that would distract him from managing the onsite EP activities and no changes in staffing have occurred.

The licensee provided a brief overview to the inspectors of organizational changes anticipated to occur at the station over the next 15 months. The licensee expected the changes to occur gradually.

Before the end of the inspection, the licensee named a new RAEPD Manager. The new manager is from the Compliance Group and has experience participating in the ERO. She is currently qualified as an Emergency Offsite Manager.

The licensee has five Emergency Directors (EDs). This is an indication of the licensee's commitment to actively support the ERO. All five of the EDs are upper level managers at the Station. The inspectors reviewed the other ERO positions and determined that all key positions were filled by at least three qualified individuals and that the licensee was meeting, and in most cases exceeding, its NOP88A4 (Assignment of Responsibilities in Support of the PNPS Emergency Preparedness Program) goal of at least two qualified individuals for each position in the ERO. The NOP88A4 also provides guidance regarding the responsibility of individual ERO members to make prior arrangements with another qualified counterpart for coverage during situations when the designated on-call individual cannot carry out his/her response duties and to document the substitution. The inspectors concluded that the licensee has sufficient personnel and adequate controls to staff its ERO.

The Onsite EP Manager was asked about training and professional development for himself and his staff. He stated that he and his staff have attended a variety of industry meetings, conferences, and training to supplement and strengthen their EP expertise. He indicated participation in an American Nuclear Society health physics meeting, a Severe Accident Management conference, a Federal Emergency Management Agency dose assessment course, and being peer evaluators at other utilities for EP program audits or controllers during exercises. Based upon the Manager's indicated participation in these and other professional activities, the inspectors concluded that the licensee was committed to supporting the EP program and its staff development.

Overall, the inspectors determined that: (1) the licensee had sufficient qualified personnel in place to maintain the EP program; (2) in general, good procedures were being implemented, (3) the licensee was taking a methodical and proactive approach to deal with personnel and organizational changes that affect the EP program; and, (4) the licensee had good control over the EP program.

5.0 TRAINING

The inspectors reviewed the E-Plan commitments with regard to drills and exercises and verified compliance by reviewing records and lesson plans, drill attendance and reports, and by interviewing licensee personnel.

The inspectors observed a demonstration of the data base for ERO training records which illustrated the capabilities of the system to search and identify individuals with expiring qualifications. The inspectors noted several individuals with expired qualifications but found that they had already been removed from the ERO by the licensee. The supervisors of those with expired qualifications and those within the grace period had been notified by the EP department in order to hasten the scheduling of the needed training.

The inspectors reviewed the licensee's ERO training matrix and sampled the records of several individuals to determine whether they had taken the designated training courses for their ERO positions. No discrepancies were noted. The inspectors inquired about respiratory protection training for repair team members as it pertains to their ERO qualifications. The inspectors were informed that respiratory protection training was covered during the annual General Employee Training (GET) and that if individuals do not complete annual GET training, they were identified as having expired qualifications and were not permitted to be on the ERO.

The inspectors reviewed the lesson plans for Classifications, Dose Assessment/Protective Actions, and Senior Emergency Management Training. The lesson plans for these important topics were well organized and covered the necessary information in sufficient depth.

The inspectors reviewed drill records to ensure that the licensee was meeting its E-Plan commitments in that area. The inspectors selected Medical Emergency, Radiological Monitoring Team, Health Physics, Post-Accident Sampling System, and Augmentation Drills and verified that they were being conducted at the proper frequency. The inspectors also reviewed several licensee drill and exercise reports and determined that positive and negative comments, as well as recommendations, were being documented. The licensee was sufficiently self-critical and detailed in the reports to provide meaningful feedback to effect improvement.

In addition, the inspectors reviewed a list of players and their positions in the drills. The inspectors selected several key positions (Emergency Director, Emergency Offsite Manager, Dose Assessment Engineer, TSC Supervisor, and Emergency Plant Manager) and determined that the licensee was rotating different individuals through the positions for the drills. The procedure, EP-AD-200, "Planning and Scheduling of Drills and Exercises", directs EDs to be rotated for drills/exercises. The EP department, on its own initiative, also rotates other players and controllers to improve the ERO members' familiarity with their positions. During Inspection 94-12, inspectors concluded that sufficient rotation of individuals assigned as EDs for drills in the past year was lacking. At the exit meeting for that inspection, the licensee committed to rotate more individuals in the ED position during upcoming drills. The inspectors determined that the rotation of different ERO personnel through the positions was adequate.

The inspectors verified that the licensee was providing annual Emergency Action Level (EAL) training to State and local officials. The inspectors reviewed attendance sheets for the September 9, 1994 and June 12, 1995 EAL training sessions and the material that was presented. Attendees received a book which explains the EALs in layman's terms for future reference. For State and local officials who did not attend, the licensee sent the books to their respective emergency operations centers. The inspectors determined that the training was generally well attended and that it disseminated the appropriate information.

The inspectors sampled the Licensed Operator Requalification Training (LORT) scenario bank. The LORT scenarios contained conditions that resulted in declarations of Unusual Events, Alerts, and Site Area Emergencies, providing ample training and practice with the lower level EALs. The inspectors asked the licensee about providing training for the operators to address General Emergency (GE) events. The licensee indicated that the operators were trained on one or two GE scenarios every year. These were special scenarios developed for the operators to emphasize their EP duties, such as declaring events, completing the appropriate forms, making notifications, and developing protective action recommendations. The inspectors found the licensee's efforts in this area were acceptable.

Based upon the licensee's lesson plans, interviews with personnel, drill training records, and the ability to monitor personnel qualifications, the inspectors concluded that the licensee's efforts in this area were satisfactory.

6.0 INDEPENDENT REVIEWS AND AUDITS

The inspectors reviewed the 1993 and 1994 audit reports.

Independent audits were performed every twelve months by at least two representatives from the QA Department, supplemented by an EP technical specialist from an outside, independent support organization.

The inspectors found that the audits were comprehensive and thorough, and identified areas requiring corrective action. The audits satisfied 10 CFR 50.54(t) requirements.

The 1993 audit report had two Deficiency Reports (DRs) and three Recommendation Reports (RRs). The 1994 audit report had one DR; one Problem Report; and three RRs.

Several mechanisms were in use to track open items to completion. Audit findings were handled as Management Corrective Action Requests and Deficiency Reports (requiring immediate attention), or as Recommendation or Problem Reports. The inspectors' review concluded that the audit findings were being promptly brought to the attention of appropriate management levels, and that the EP staff was attentive in addressing and resolving issues identified by the auditors.

7.0 EFFECTIVENESS OF LICENSEE CONTROLS

The inspectors interviewed the Onsite EP Manager to assess the effectiveness of the licensee's self-assessment process and tracking system.

The licensee's 1994 self-assessment effort consisted of using a checklist which restates the objectives from NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants", in assessment form.

The licensee stated that the NUREG-0654 checklist will be incorporated into the Station Improvement Performance Plan (SIPP) as a tool to assess EP. According to the Onsite EP Manager, it was determined that, overall, the Corporate emergency planning needs tighter controls to support the Station's EP program and that the two separate plans (Corporate and Station) need to be better integrated. This year's self-assessment effort consisted of a committee which addressed human resource issues within the EP department, such as empowerment, respect, and union-management relations.

The licensee has utilized probabilistic risk assessment (PRA) techniques in the development of the Station's Severe Accident Management procedures. This demonstrated proactive planning and a logical approach to prepare for unlikely events that could possibly threaten the public.

The licensee had several systems to track EP issues and activities. The EPASS (EP Activity Scheduling System) was initiated by the Station EP department to track less significant EP issues, such as drill, exercise, or training issues. There was also the IADB (Integrated Action Data Base), which is a station-wide system that monitors more significant programmatic issues. The licensee estimated that, by February or March of 1996, EPASS would be absorbed by IADB. The licensee also had the Master Surveillance Tracking Program to monitor various EP activities, such as surveillances, to ensure necessary activities were completed. Thus, the licensee had sufficient means to track EP-related issues and activities and to keep management apprised of program status.

The licensee's response to several NRC identified issues on previous inspections was appropriate. The licensee quickly and thoroughly addressed the potential for an inadequate review of procedure changes by including the 10 CFR 50.54(q) review criteria for EP procedure change reviews. Regarding the rotation of different players through the ERO positions, the licensee's records indicated a strong effort to ensure that different individuals participated in the drills and exercises. The core damage procedure usage issue from the November 1994 exercise indicated that the licensee pursued the root cause (failure to communicate the limitations of the estimate) and had corrective actions planned to demonstrate remediation during the next exercise.

Overall, the licensee effectively controlled the EP program and resolved issues promptly.

8.0 COMMUNICATIONS

The inspectors met with licensee personnel and were given a presentation which detailed various features of the Station's communications capabilities. The New York New England Exchange (NYNEX) provides fiber-optic and metal under ground lines from the north and south to the Station. The NYNEX also provides the dial tone from the central office (CO) exchange located in Plymouth, MA, for all of the Station systems.

The Digital Notification Network (DNN) system is the primary method of communications with the Commonwealth of Massachusetts and local governments with Boston Edison Community Offsite Notification System (BECONS) as the radio backup. Additionally, the Station has the normal Private Branch Exchange (PBX) systems, ring down systems through the Plymouth CO, radio systems, which include State Police, local call around, and Station radios, a micro-wave system and cellular phones.

The common failure made is loss of the Master PBX computer which will cause the other two station's PBX units to fail. This failure only affects normal telephone usage in the plant and office building. Emergency telephone systems are supplied from the Plymouth CO and the BECo office PBX in the Prudential office in Boston, Massachusetts.

The BECONS system signal is transmitted from two different locations and has either a battery or diesel generator as backup power supplies. The licensee can set up temporary antennas, which are stored in the warehouse, if the primary ones are damaged. The licensee also has cellular telephones that can be used in the control room. (They are wired to antennas on the roof so that their signals will not interfere with control room electronic equipment.) The licensee stated that some communications equipment was rendered inoperable by the effects of Hurricane Bob in 1992, but communications were maintained with offsite agencies throughout the event.

The licensee communications systems appeared to be adequate for heavy weather and other emergency situations.

9.0 DOSE ASSESSMENT COMPARISON

During the inspection, comparisons between the licensee's computer code "Dose Assessment and Protective Action Recommendation (DAPAR)" Version 1, and the NRC's "Radiologic Assessment System for Consequence Analysis (RASCAL)" Version 2.1, March 1995, were made. The results of nine cases examined indicated very good agreement. Of the nine cases, the differences were within a factor of two - 51% of the time, a factor of four - 76% of the time, and within a factor of eight - 95% of the time. Graphs of the comparisons are contained in Attachment 2.

Due to the different parameters (such as mixing heights and other plant default values) being used with RASCAL and DAPAR, some differences in projected dose results were expected. The NRC considers results within a factor of ten to be acceptable.

10.0 SOUTH WEYMOUTH RECEPTION CENTER

It is an emergency reception center in the event of a serious nuclear accident at the Plymouth Station. The licensee stated that the Commonwealth of Massachusetts received a letter, dated August 11, 1995, from the South Weymouth Naval Base Commander indicating that the base is

scheduled to be closed in the future. The inspectors discussed the South Weymouth Reception Center with licensee representatives. The inspectors discussed the South Weymouth Reception Center with licensee representatives.

According to the licensee, during recent meetings with the Base Commander, the Commonwealth of Massachusetts and the licensee were informed that the base would be closed during the next 18 - 24 months. The licensee indicated that the Commonwealth of Massachusetts is considering two options: 1) negotiate use of the present facilities and train additional Civil Defense volunteers to replace the base enlisted personnel who presently staff the reception center; or 2) move the reception center to one of the current host schools for the ten mile emergency planning zone, and train additional personnel to staff the center.

The licensee committed to provide updates to the NRC on the progress of this issue every six months.

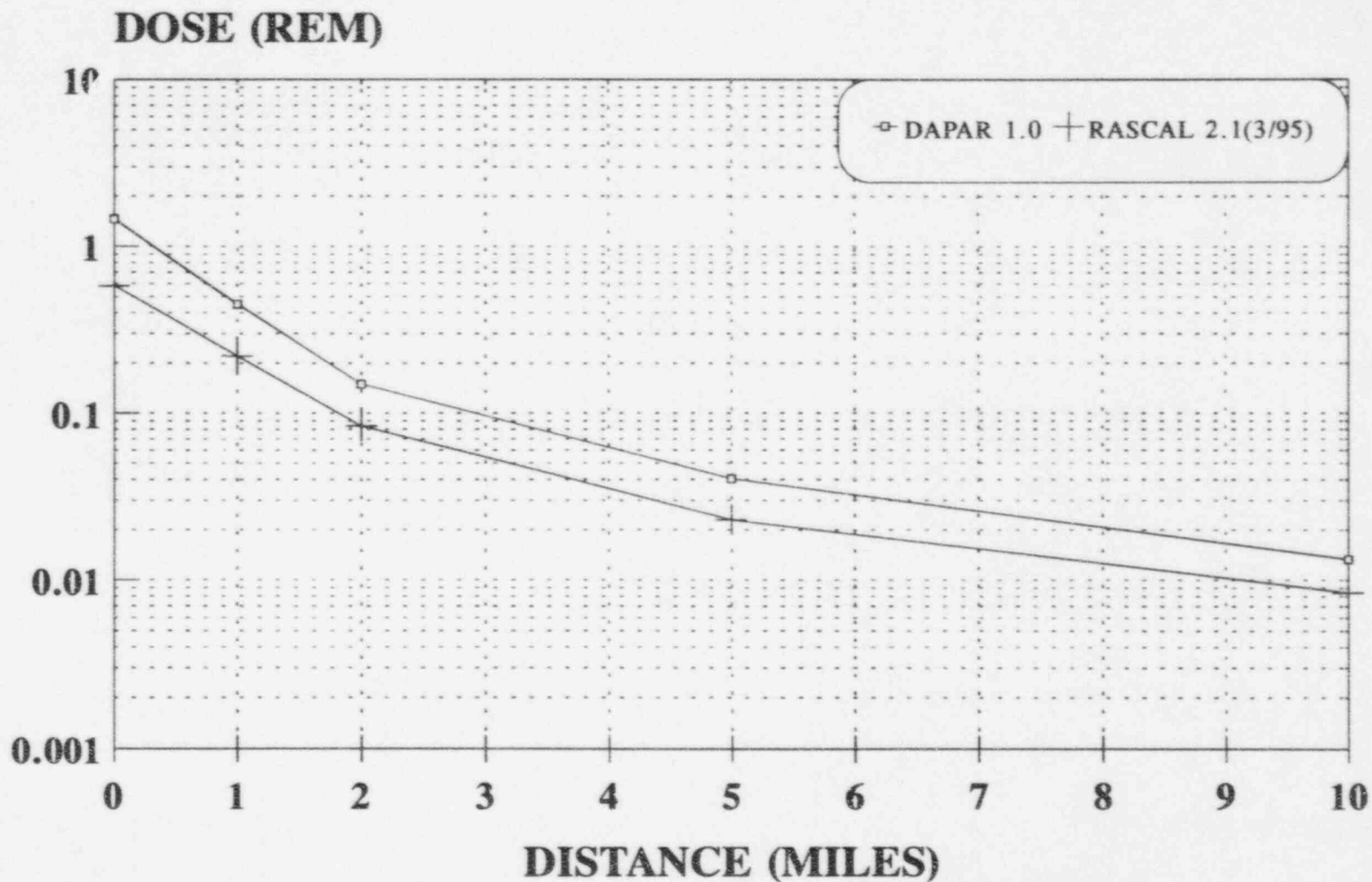
11.0 EXIT MEETING

At the end of the inspection, the inspectors met with licensee personnel listed in Detail 1 of this report and discussed the scope and findings of the inspection.

The licensee acknowledged the NRC findings and confirmed the commitments made by its representatives during the inspection.

PROJECTED DOSE COMPARISON

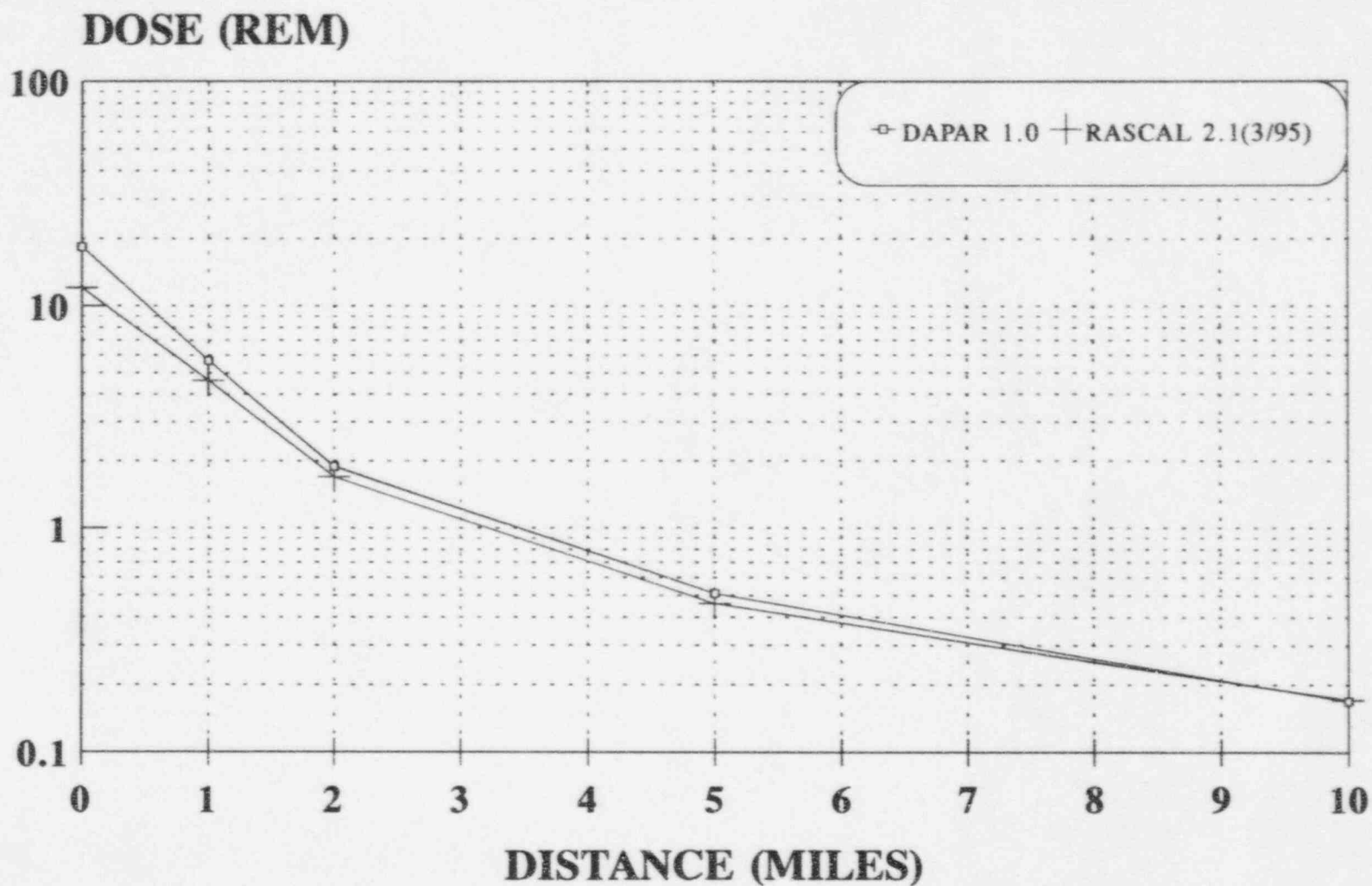
PIL Drywell Leakage 0.5% per day Based on Plant Conditions



Case A: 4 miles/hr and Stability class D (TEDE)

PROJECTED DOSE COMPARISON

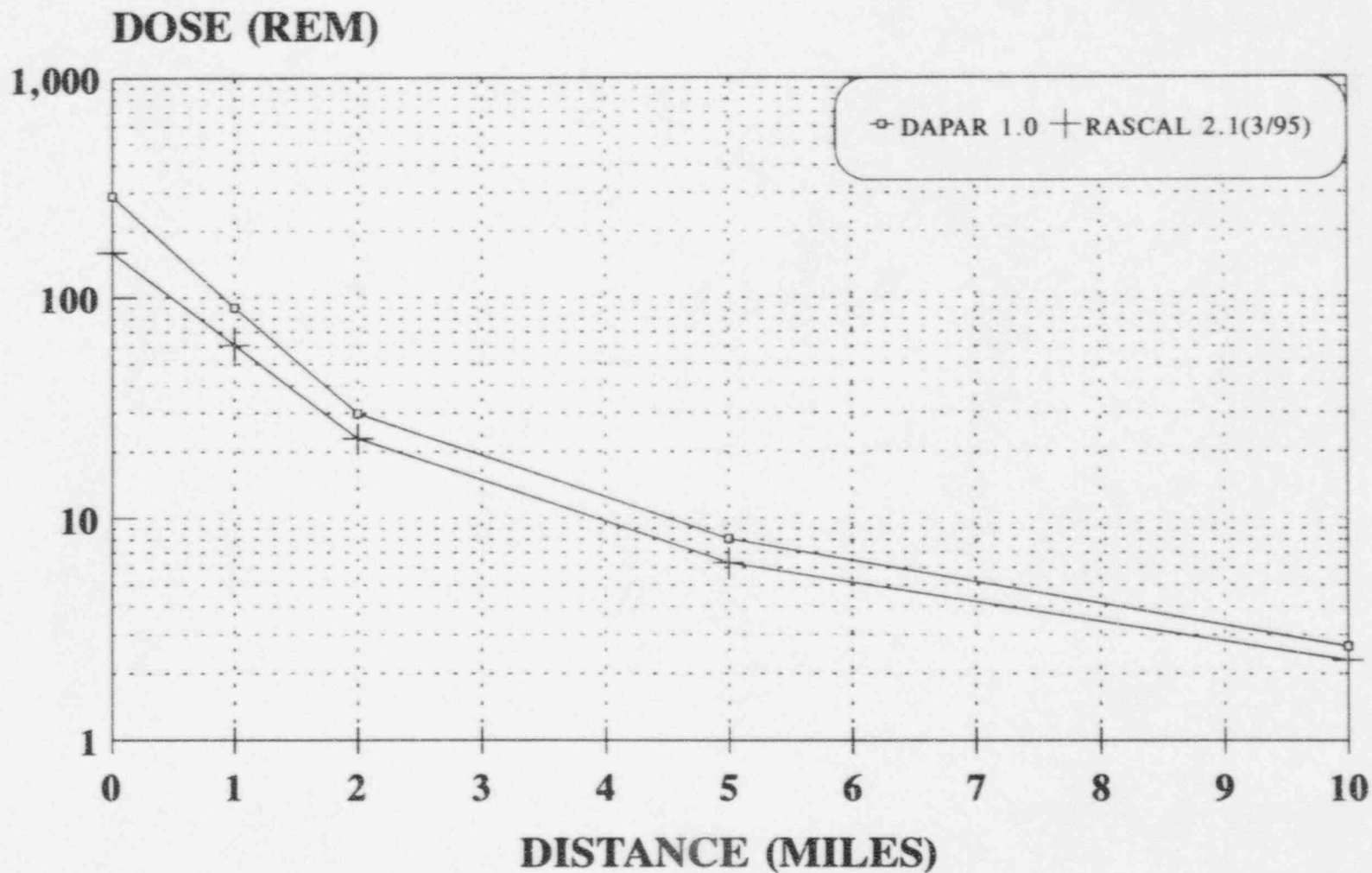
PIL Drywell Leakage 0.5% per day Based on Plant Conditions



Case B: 4 miles/hr and Stability class D (Thyroid)

PROJECTED DOSE COMPARISON

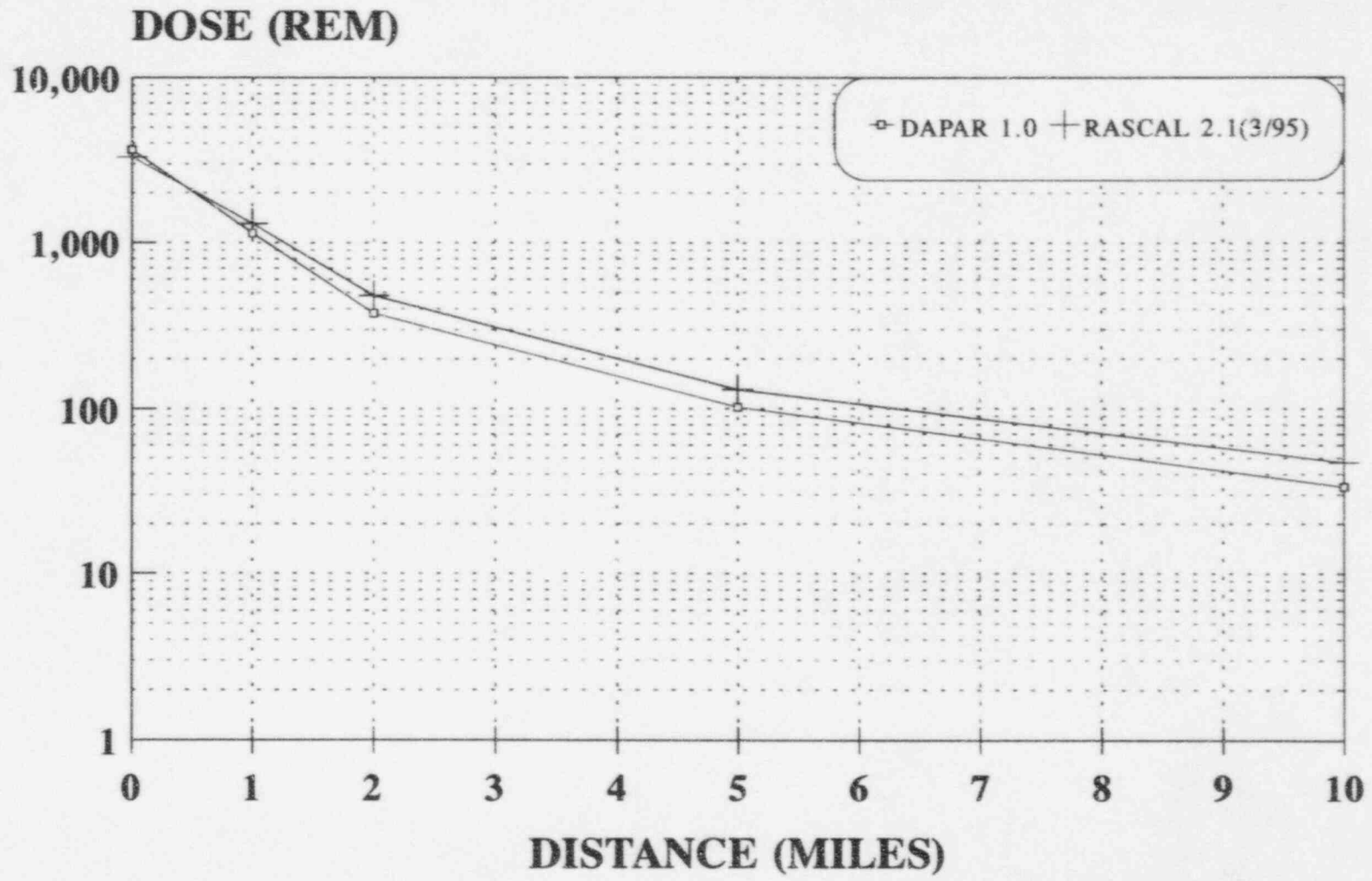
PIL 100% Gap; Ground Level Release, Failure to Isolate



Case C: 4 miles/hr and Stability class D (TEDE)

PROJECTED DOSE COMPARISON

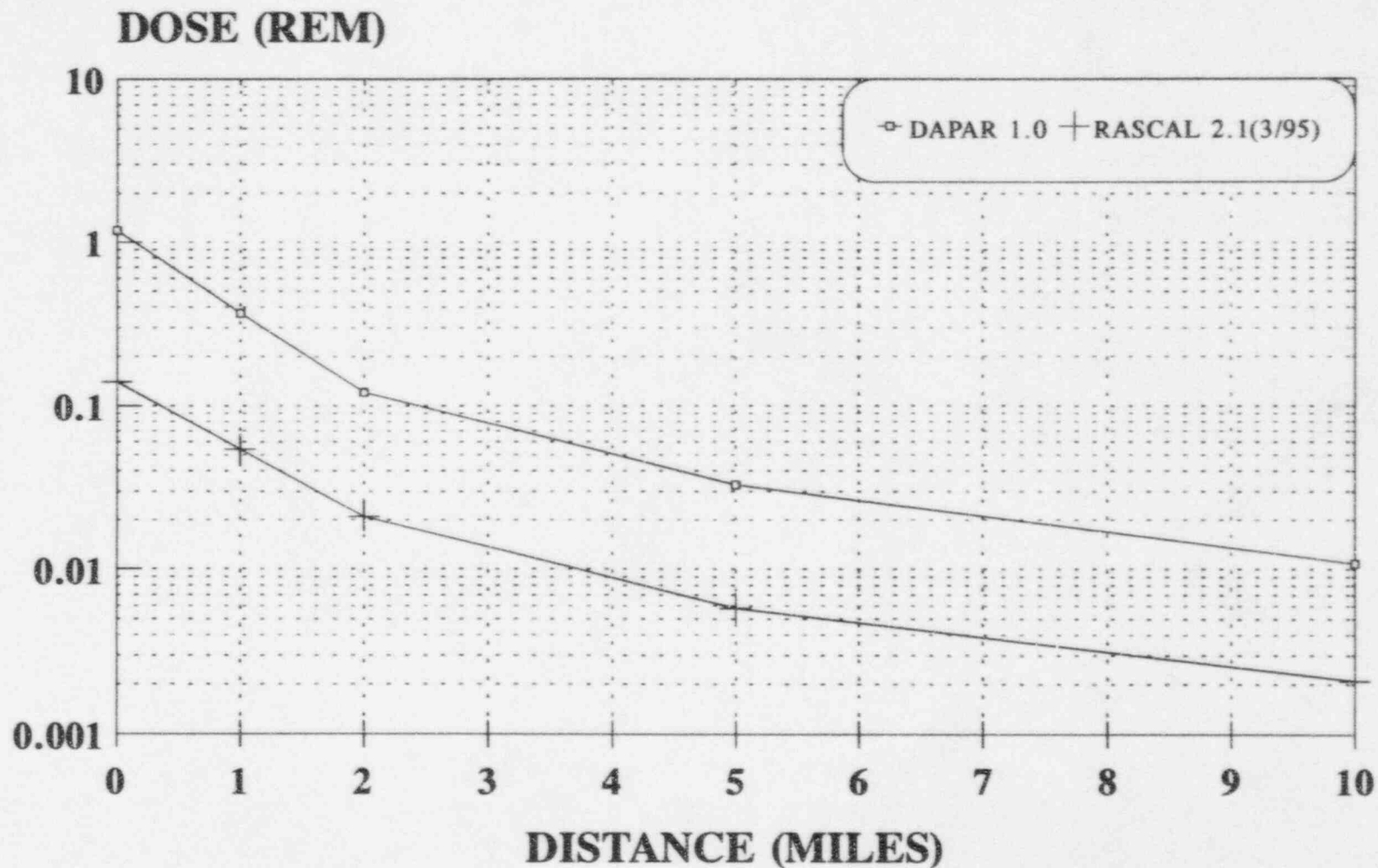
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Case D: 4 miles/hr and Stability class D (Thyroid)

PROJECTED DOSE COMPARISON

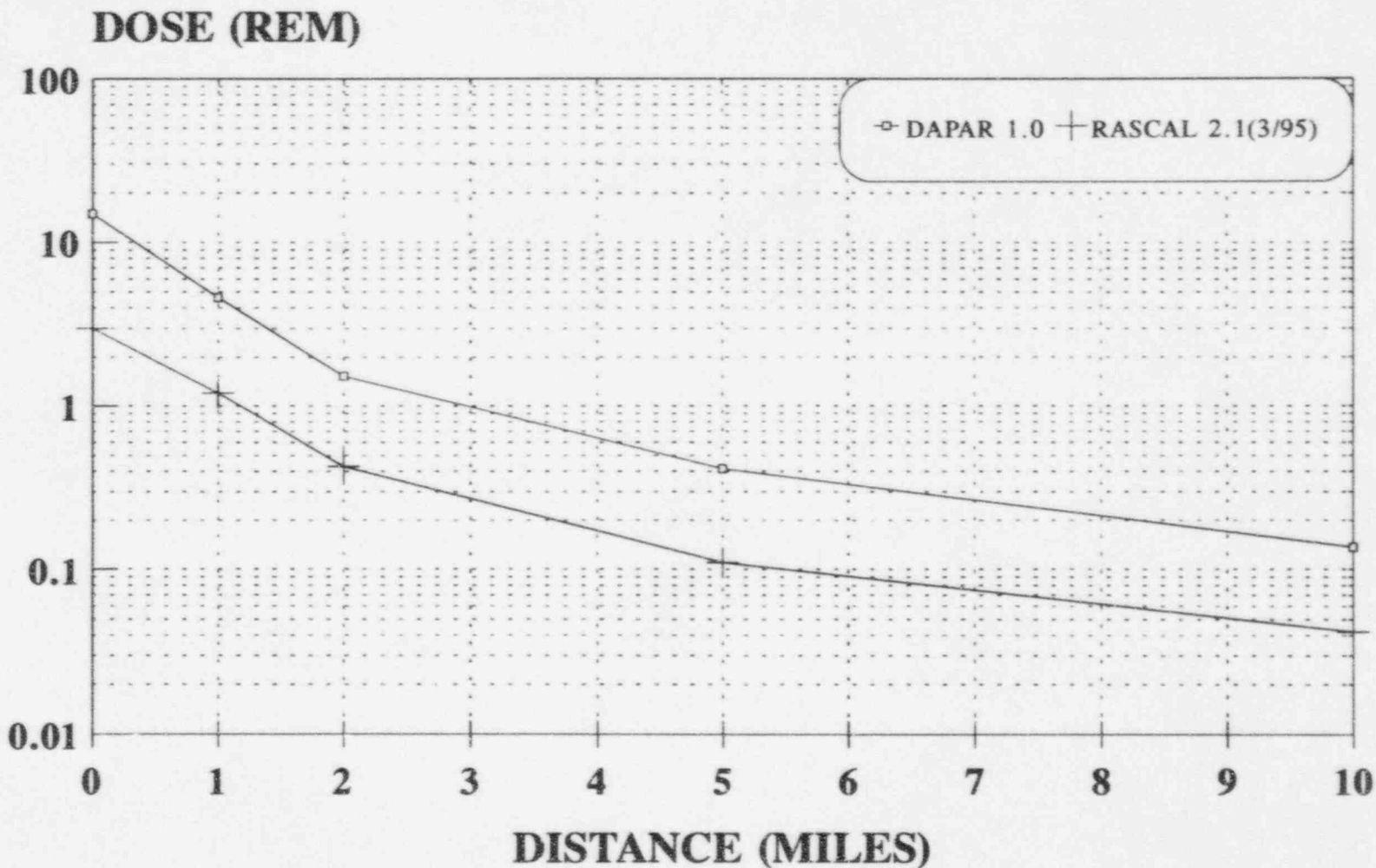
PIL 100% Gap; Ground Release



Case E: 4 miles/hr and Stability class D (TEDE)

PROJECTED DOSE COMPARISON

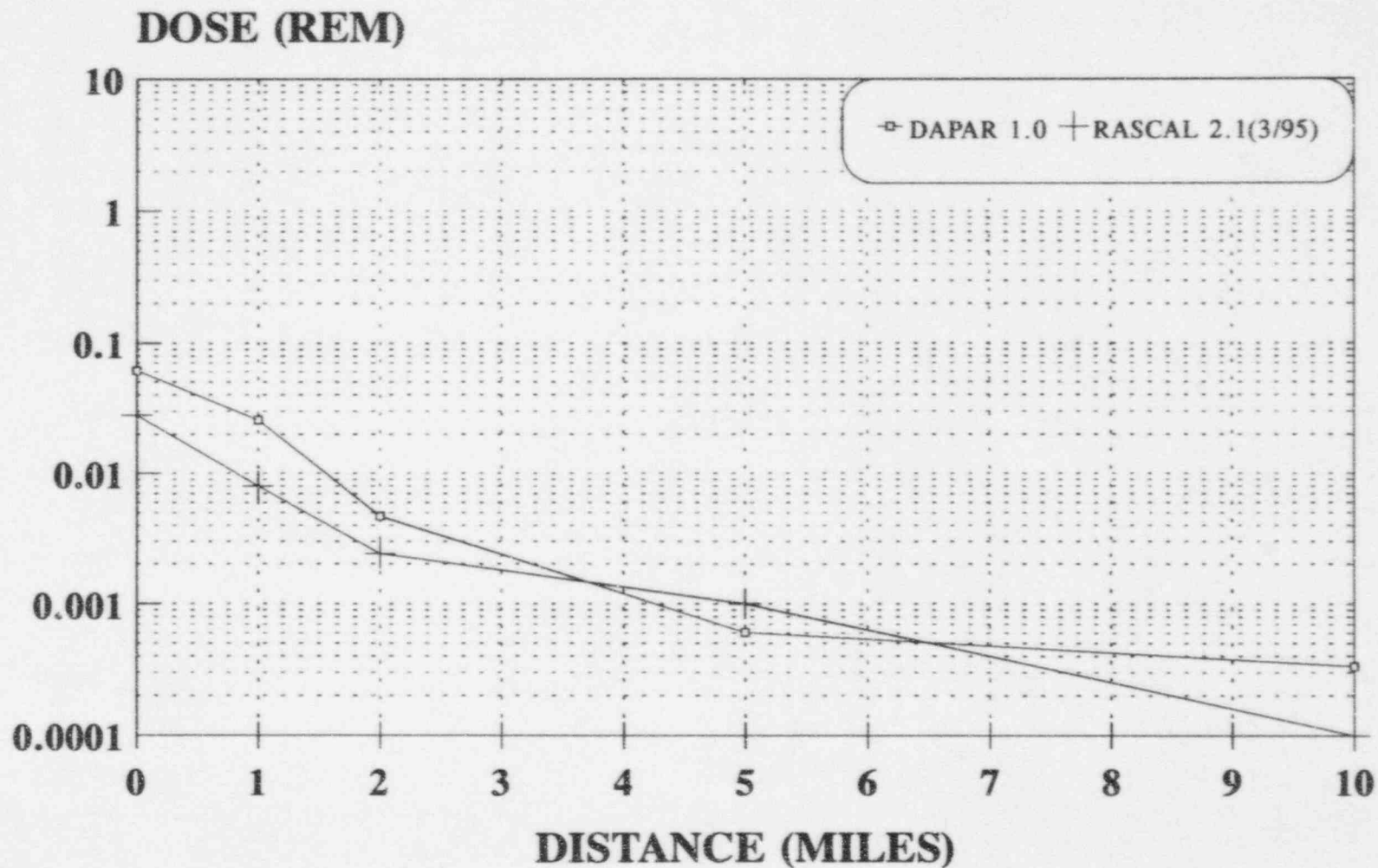
PIL 100% Gap; Ground Release



Case F: 4 miles/hr and Stability class D (Thyroid)

PROJECTED DOSE COMPARISON

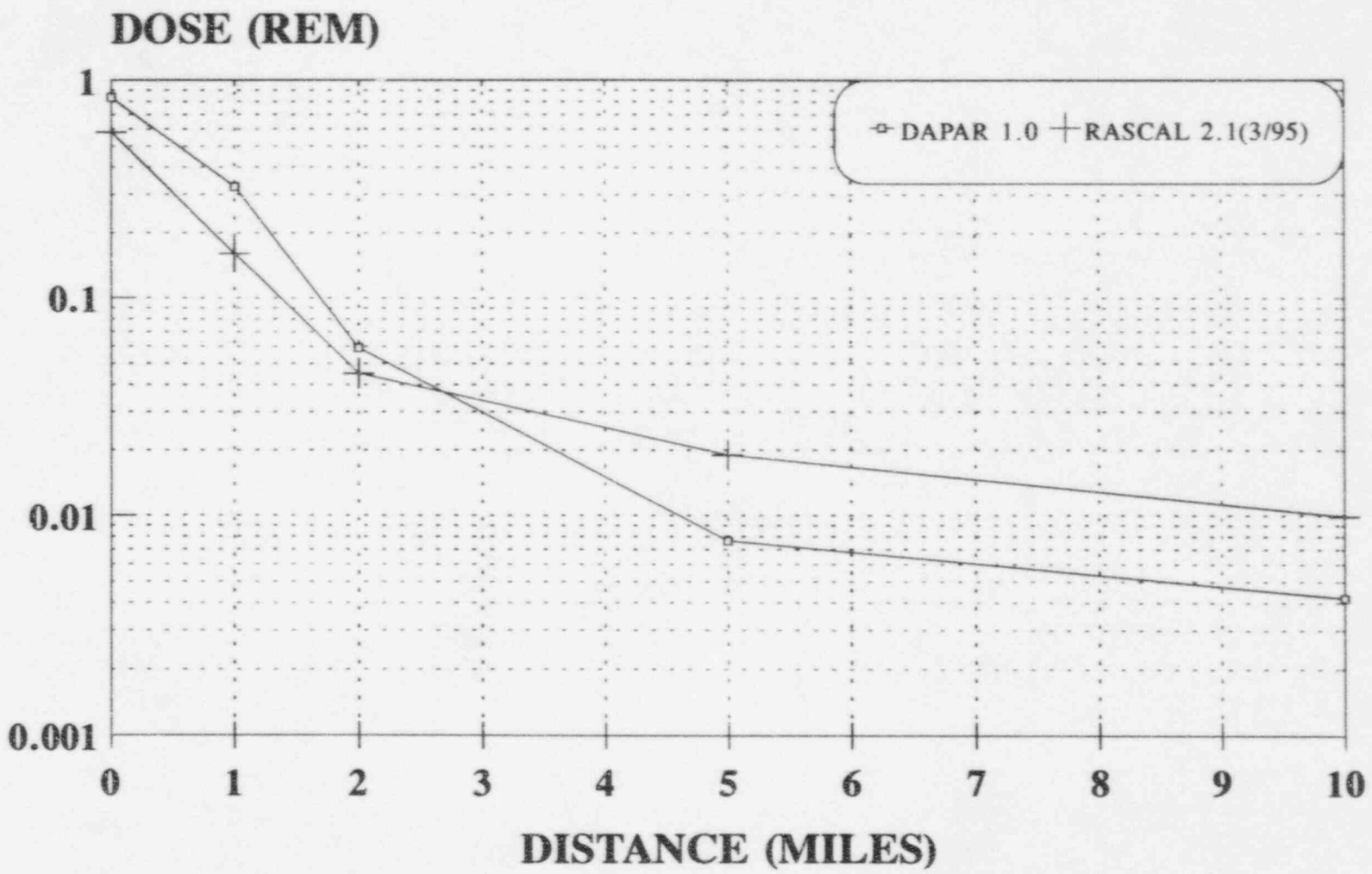
PIL 100% Gap; Elevated Release Height



Case G: 4 miles/hr and Stability class B (TEDE)

PROJECTED DOSE COMPARISON

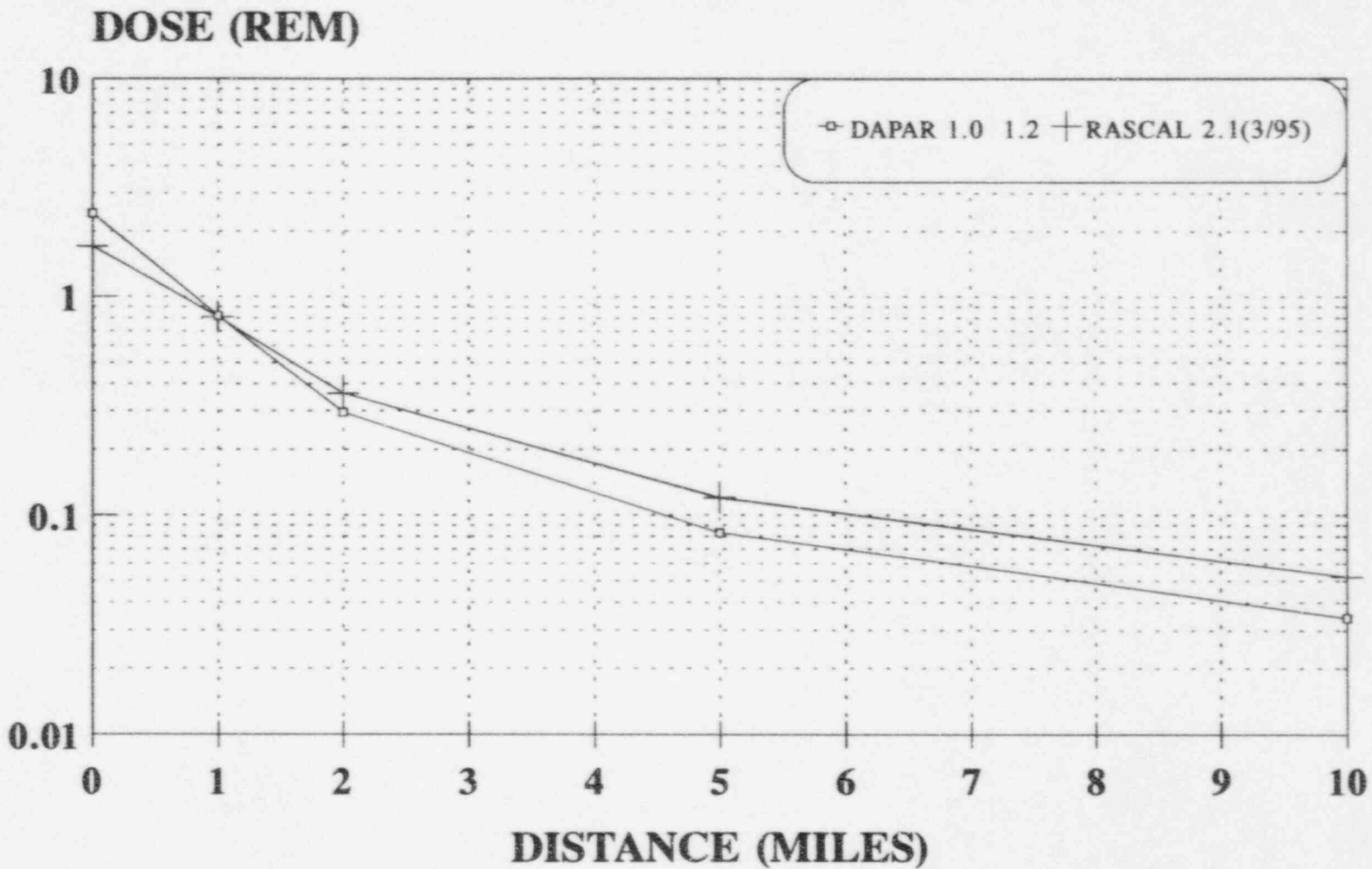
PIL 100% Gap; Elevated Release Height



Case H: 4 miles/hr and Stability class B (Thyroid)

PROJECTED DOSE COMPARISON

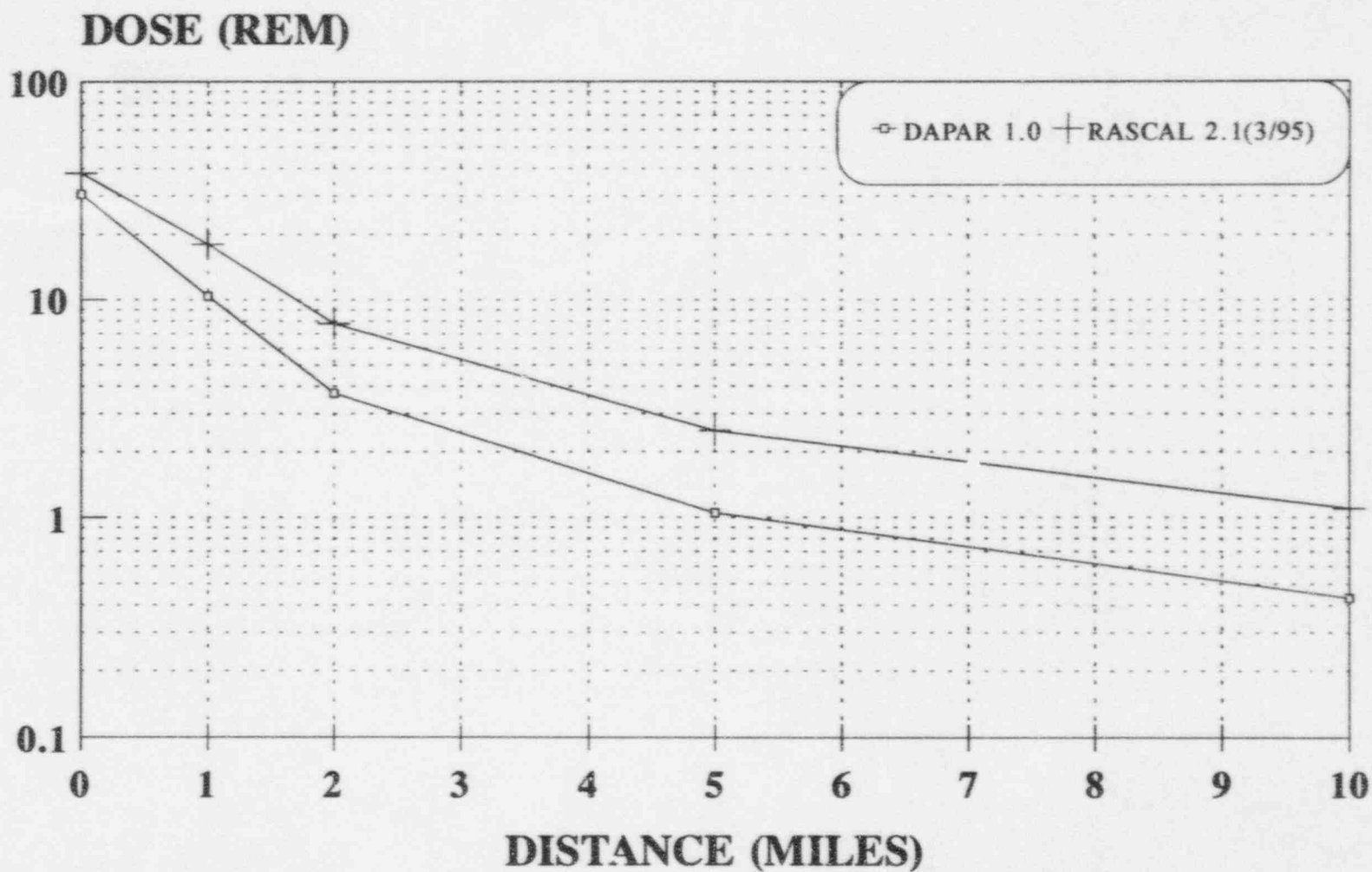
PIL 100% Gap; Ground Level Release



Case I: 10 miles/hr and Stability class F (TEDE)

PROJECTED DOSE COMPARISON

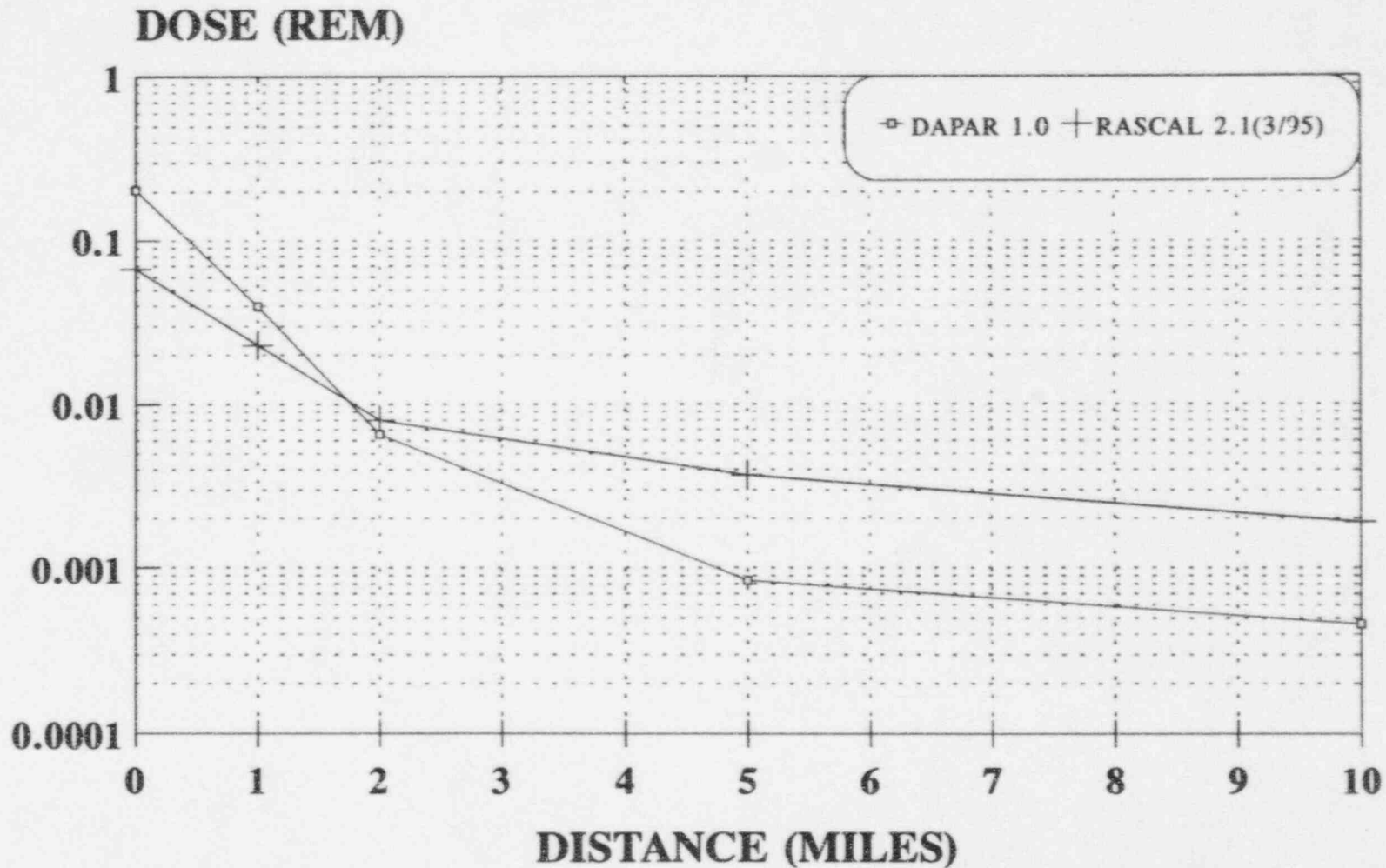
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Case J: 10 miles/hr and Stability class F (Thyroid)

PROJECTED DOSE COMPARISON

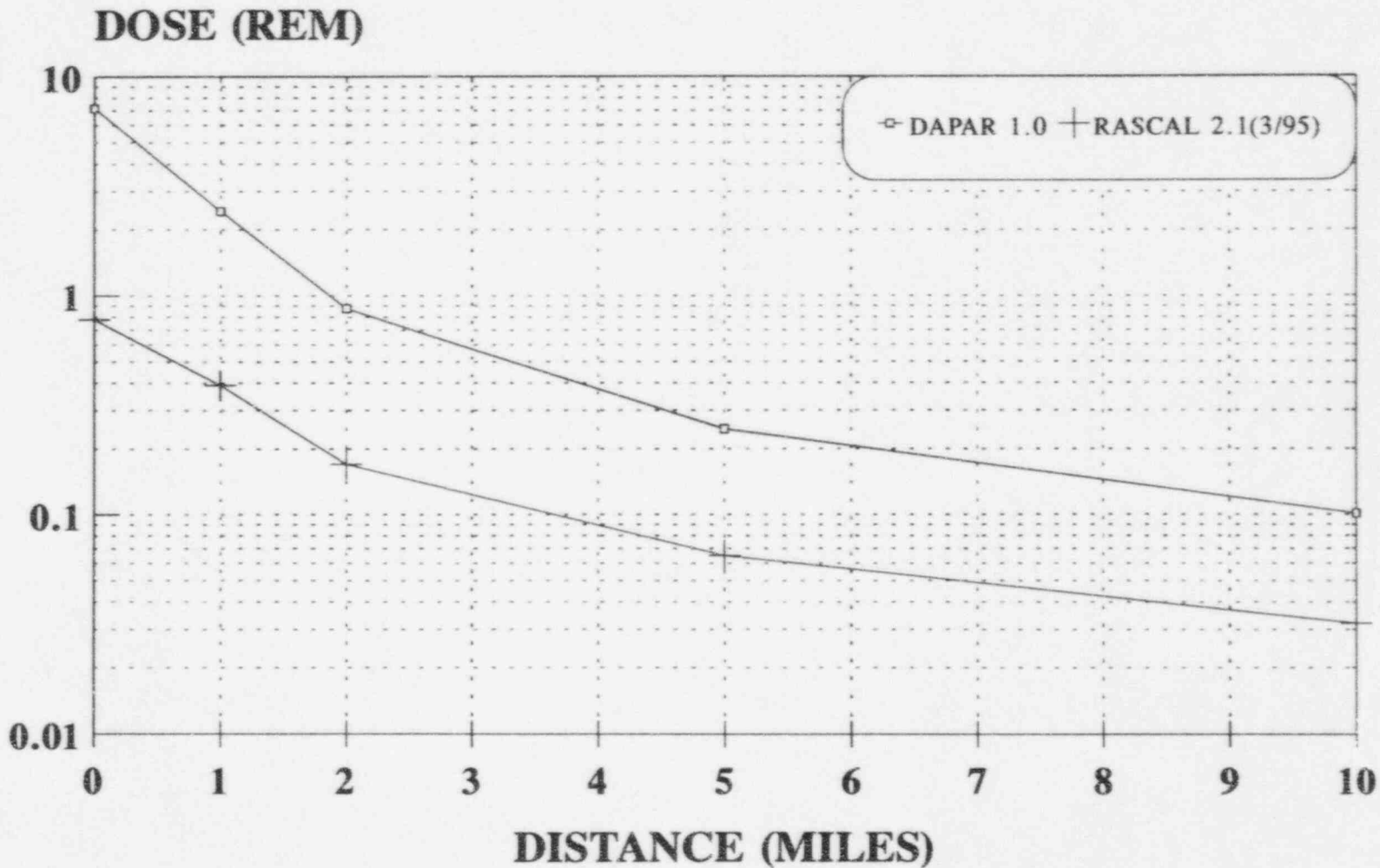
PIL Kr-88 Isotopic; Ground Level Release



Case K: 10 miles/hr and Stability class B (TEDE)

PROJECTED DOSE COMPARISON

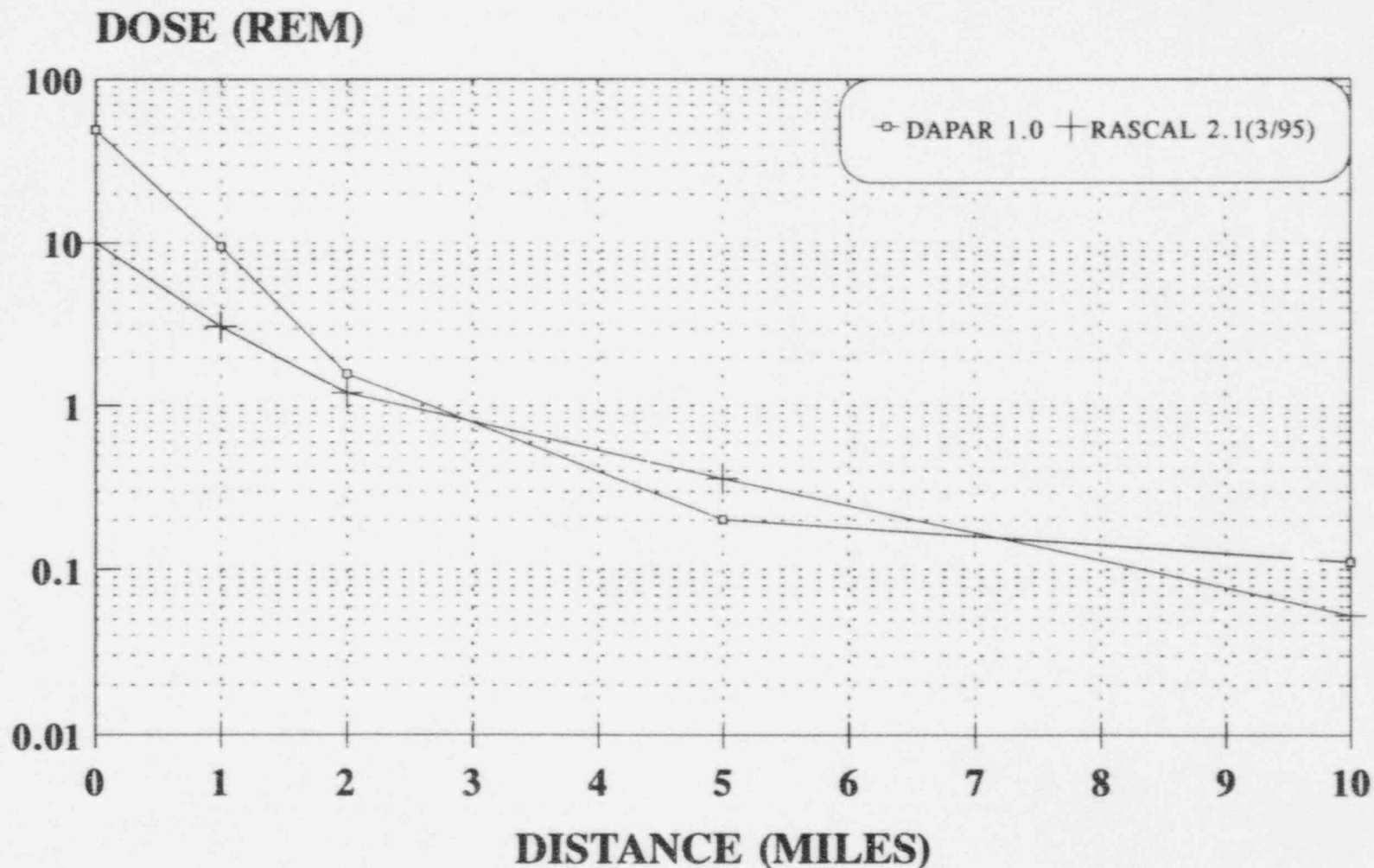
PIL Kr-88 Isotopic; Ground Level Release



Case L: 10 miles/hr and Stability class F (TEDE)

PROJECTED DOSE COMPARISONS

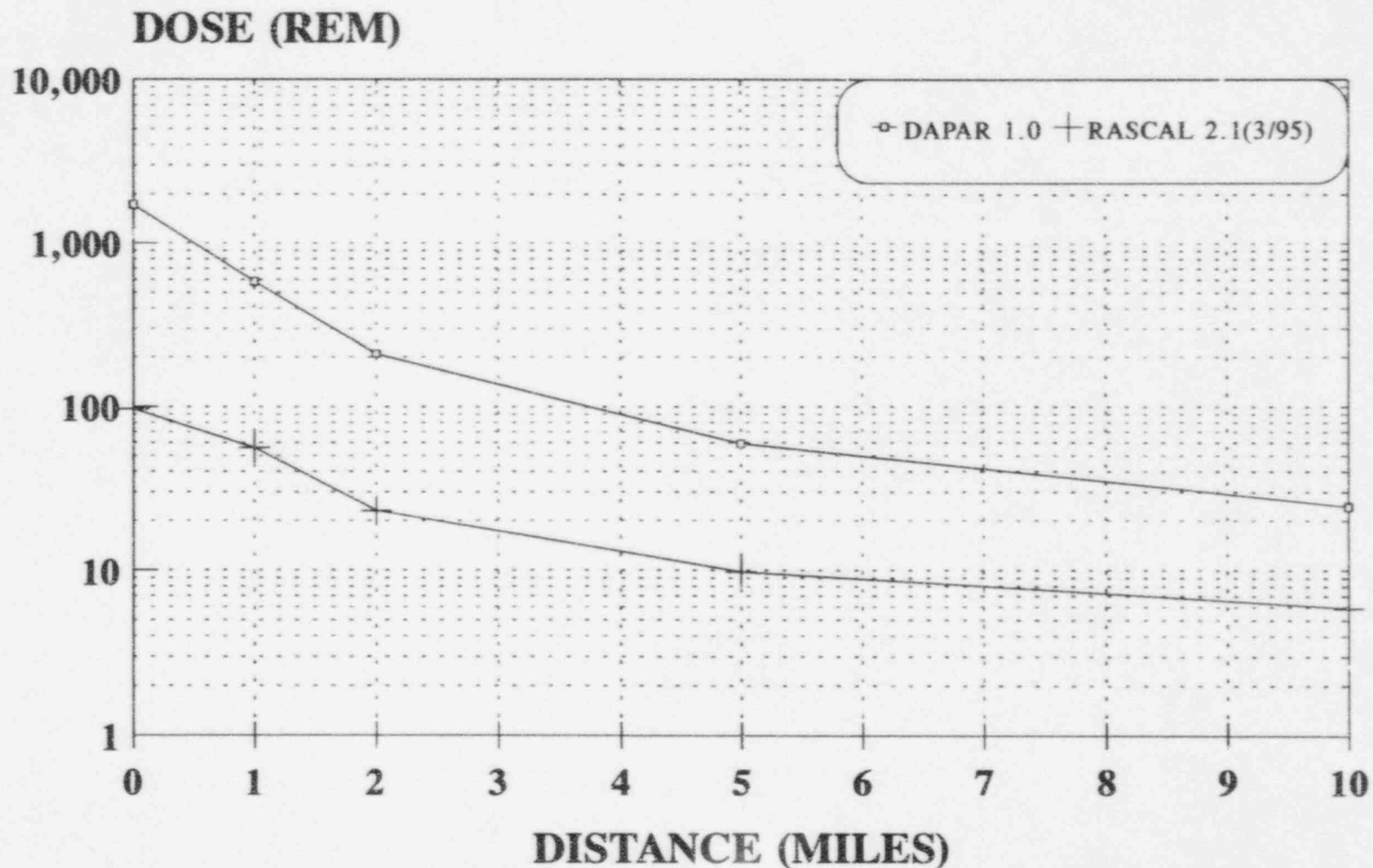
PIL Xe-133 Isotopic; Ground Level Release



Case M: 10 miles/hr and Stability class B (TEDE)

PROJECTED DOSE COMPARISON

PIL Xe-133 Isotopic; Ground Level Release



Case N: 10 miles/hr and Stability class F (TEDE)