



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

*Docket*  
*50-305*

December 15, 1977

All Power Reactor Licensees

The demonstrated reliability of standby diesel generator (DG) units in operating nuclear power plants has been less than anticipated. The NRC has concluded that a systematic review and analysis of operating problems associated with diesel generator units is necessary to establish what practical measures may be taken to enhance the reliability of these units. The NRC, with the assistance of the University of Dayton, has initiated such a study. It is our intent that this study will provide practical results that will prove useful to each nuclear utility, therefore, each operating reactor licensee is requested to respond to the enclosed questionnaire.

An analysis will be performed on the information received and the results of this analysis, along with recommendations that may lead to improved reliability, will be transmitted to licensees and applicants for their use. We believe that this information will assist in identifying as well as avoiding or minimizing operating experiences encountered by others. We view this effort as one of mutual interest.

We ask that a single completed copy of the enclosed questionnaire be returned to the Director of Nuclear Reactor Regulation, U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, by January 20, 1978. Please include on a separate sheet the name, address and phone number of the person(s) at the reactor site responsible for completing the questionnaire and responsible for responding to any follow-up communications concerning the questionnaire or for arranging a reactor site visit.

The responses to the majority of the questions can be answered with just a few words or by checking the appropriate space. In responding to those questions which do not apply to a particular installation and/or situation, please indicate "N/A" for "not applicable". If the question does apply to a particular installation or situation but the answer is not known, please indicate "UN" for "unknown". For those entries on the questionnaire where the requested information is not known by January 20, 1978, please provide it in follow-up correspondence when it becomes available.

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Further, the detailed information obtained in this study will be subject to disclosure pursuant to the Freedom on Information Act Regulations as implemented by 10 CFR Part 9 - Public Records.

In the event that any information requested as a part of this study, is considered by you (or your contractor) to be proprietary, it is necessary that you make a written application to withhold such information from public disclosure. Any such application must be accompanied by an affidavit executed by the owner of the information, which identifies the document or part sought to be withheld, and which contains a statement of reasons which address with specificity the items which will be considered by the Commission as listed in subparagraph (b)(4) of Section 2.790 of NRC's "Rules and Practice", Part 2, Title 10, Code of Federal Regulations. The information sought to be withheld shall be incorporated as far as possible into a separate part of the affidavit.

In the event any portion of the questionnaire needs clarification, please contact F. Clemenson at (301) 492-8077.

This request for generic information was approved by GAO under a blanket clearance number B-180225 (R0072); this clearance expires July 31, 1980.

Sincerely,

*Karl R. Goller*

Karl R. Goller, Assistant Director  
for Operating Reactors  
Division of Operating Reactors

Enclosure:  
Questionnaire

cc w/enclosure:  
See next page

Docket No. 50-313

Arkansas Power & Light Company  
ATTN: Mr. William Cavanaugh, III  
Executive Director  
Generation and Construction  
Department

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Little Rock, Arkansas 72203

cc: Phillip K. Lyon, Esquire  
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Mr. Daniel H. Williams  
Manager, Licensing  
Arkansas Power & Light Company  
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Little Rock, Arkansas 72203

Mr. John W. Anderson, Jr.  
Plant Superintendent  
Arkansas Nuclear One  
Post Office Box 608  
Russellville, Arkansas 72801

Arkansas Polytechnic College  
Russellville, Arkansas 72801

Docket Nos. 50-317  
and 50-318

Baltimore Gas and Electric Company  
ATTN: Mr. A. E. Lundvall, Jr.  
Vice President - Supply  
P. O. Box 1475  
Baltimore, Maryland 21203

cc: James A. Biddison, Jr.  
General Counsel  
G and E Building  
Charles Center  
Baltimore, Maryland 21203

Mr. R. C. L. Olson  
Baltimore Gas and Electric Company  
Room 922 - G and E Building  
Post Office Box 1475  
Baltimore, Maryland 21203

Mr. R. M. Douglass, Chief Engineer  
Calvert Cliffs Nuclear Power Plant  
Baltimore Gas and Electric Company  
Lusby, Maryland 20657

Bechtel Power Corporation  
ATTN: Mr. R. L. Ashley  
Chief Nuclear Engineer  
P. O. Box 607  
Gaithersburg, Maryland 20760

Combustion Engineering, Inc.  
ATTN: Mr. J. A. Honey  
Project Manager  
P. O. Box 500  
Windsor, Connecticut 06095

Calvert County Library  
Prince Frederick, Maryland 20678

Docket No. 50-293

Boston Edison Company  
M/C NUCLEAR  
ATTN: Mr. G. Carl Andognini  
800 Boylston Street  
Boston, Massachusetts 02199

cc: Mr. Paul J. McGuire  
Pilgrim Station Acting Manager  
Boston Edison Company  
RFD #1, Rocky Hill Road  
Plymouth, Massachusetts 02360

Anthony Z. Roisman, Esquire  
Sheldon, Harmon & Roisman  
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Washington, D. C. 20005

Henry Herrmann, Esquire  
Massachusetts Wildlife Federation  
151 Tremont Street  
Boston, Massachusetts 02111

Plymouth Public Library  
North Street  
Plymouth, Massachusetts 02360

Docket No. 50-261

Carolina Power & Light Company  
ATTN: Mr. J. A. Jones  
Senior Vice President  
336 Fayetteville Street  
Raleigh, North Carolina 27602

cc: Hartsville Memorial Library  
Home and Fifth Avenue  
Hartsville, South Carolina 29550

Docket Nos. 50-325  
and 50-324

Carolina Power & Light Company  
ATTN: Mr. J. A. Jones  
Executive Vice President  
336 Fayetteville Street  
Raleigh, North Carolina 27602

cc: Richard E. Jones, Esquire  
Carolina Power & Light Company  
336 Fayetteville Street  
Raleigh, North Carolina 27602

George F. Trowbridge, Esquire  
Shaw, Pittman, Potts & Trowbridge  
1800 M Street, N. W.  
Washington, D. C. 20036

John J. Burney, Jr., Esquire  
Burney, Burney, Sperry & Barefoot  
110 North Fifth Avenue  
Wilmington, North Carolina 28401

Southport-Brunswick County Library  
109 West Moore Street  
Southport, North Carolina 28461

Docket No. 50-10

Commonwealth Edison Company  
ATTN: Mr. R. L. Bolger  
Assistant Vice President  
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Chicago, Illinois 60690

cc: Mr. John W. Rowe  
Isham, Lincoln & Beale  
Counselors at Law  
One First National Plaza, 42nd Floor  
Chicago, Illinois 60603

Mr. B. B. Stephenson  
Plant Superintendent  
Dresden Nuclear Power Station  
Rural Route #1  
Morris, Illinois 60450

Docket Nos. 50-237  
and 50-249

Commonwealth Edison Company  
ATTN: Mr. R. L. Bolger  
Assistant Vice President  
P. O. Box 767  
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cc: Morris Public Library  
604 Liberty Street  
Morris, Illinois 60451

Docket Nos. 50-254  
and 50-265

Commonwealth Edison Company  
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Assistant Vice President  
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cc: Mr. D. R. Stichnoth  
President  
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Electric Company  
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Mr. Nick Kalivianakas  
Plant Superintendent  
Quad-Cities Nuclear Power Station  
22710 - 206th Avenue - North  
Cordova, Illinois 61242

Moline Public Library  
504 - 17th Street  
Moline, Illinois 61265

Docket Nos. 50-295  
and 50-304

Commonwealth Edison Company  
ATTN: Mr. R. L. Bolger  
Assistant Vice President  
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Director of Research & Development  
Metropolitan Sanitary District  
of Greater Chicago  
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Chicago, Illinois 60611

Waukegan Public Library  
128 North County Street  
Waukegan, Illinois 60085

Docket No. 50-213

Connecticut Yankee Atomic Power Company  
ATTN: Mr. Donald C. Switzer  
President  
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Hartford, Connecticut 06101

cc: Day, Berry, & Howard  
Counselors at Law  
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Hartford, Connecticut 06103

Russell Library  
119 Broad Street  
Middletown, Connecticut 06457



Docket Nos. 50-3  
and 50-241

Consolidated Edison Company  
of New York, Inc.  
ATTN: Mr. William J. Cahill, Jr.  
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cc: Leonard M. Trosten, Esquire  
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Director, Technical Development  
Programs  
State of New York Energy Office  
Agency Building 2  
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Albany, New York 12223

White Plains Public Library  
100 Martine Avenue  
White Plains, New York 10601

Docket No. 50-286

Consolidated Edison Company  
of New York, Inc.  
ATTN: Mr. William J. Cahill, Jr.  
Vice President  
4 Irving Place  
New York, New York 10003

cc: Admiral Paul Early (IP-3)  
Power Authority of the State  
of New York  
10 Columbus Circle  
New York, New York 10019

White Plains Public Library  
100 Martine Avenue  
White Plains, New York 10601

Consumers Power Company  
ATTN: Mr. David A. Bixel  
Nuclear Licensing Administrator  
212 West Michigan Avenue  
Jackson, Michigan 49201

cc: Charles F. Bayless  
Of Counsel  
Consumers Power Company  
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Jackson, Michigan 49201

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Charlevoix Public Library  
107 Clinton Street  
Charlevoix, Michigan 49720

Docket No. 50-255

Consumers Power Company  
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Nuclear Licensing Administrator  
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cc: M. I. Miller, Esquire  
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Consumers Power Company  
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Paul A. Perry, Secretary  
Consumers Power Company  
212 West Michigan Avenue  
Jackson, Michigan 49201

Kalamazoo Public Library  
315 South Rose Street  
Kalamazoo, Michigan 49006

Myron M. Cherry, Esquire  
Suite 4501  
One IBM Plaza  
Chicago, Illinois 60611

Docket No. 50-409

Dairyland Power Cooperative  
ATTN: Mr. John P. Madgett  
General Manager  
2615 East Avenue, South  
La Crosse, Wisconsin 54601

cc: Fritz Schubert, Esquire  
Staff Attorney  
Dairyland Power Cooperative  
2615 East Avenue, South  
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O. S. Heistand, Jr., Esquire  
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Mr. R. E. Shimshak  
LaCrosse Boiling Water Reactor  
Dairyland Power Cooperative  
P. O. Box 135  
Genoa, Wisconsin 54632

La Crosse Public Library  
800 Main Street  
La Crosse, Wisconsin 54601

Docket Nos. 50-269  
50-270  
and 50-287

Duke Power Company  
ATTN: Mr. William O. Parker, Jr.  
Vice President  
Steam Production  
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Charlotte, North Carolina 28242

cc: Mr. William L. Porter  
Duke Power Company  
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DeBevoise & Liberman  
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Washington, D. C. 20005

Oconee County Library  
201 South Spring Street  
Walhalla, South Carolina 29691

Docket No. 50-334

Duquesne Light Company  
ATTN: Mr. C. N. Dunn, Vice President  
Operations Division  
435 Sixth Avenue  
Pittsburgh, Pennsylvania 15219

cc: Karin Carter, Esq.  
Special Assistant Attorney General  
Bureau of Administrative Enforcement  
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Mr. J. D. Woodward  
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Duquesne Light Company  
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Duquesne Light Company  
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Pittsburgh, Pennsylvania 15219

Beaver Area Memorial Library  
100 College Avenue  
Beaver, Pennsylvania 15009

Docket Nos. 50-250  
and 50-251

Florida Power & Light Company  
ATTN: Dr. Robert E. Uhrig  
Vice President  
P. O. Box 013100  
Miami, Florida 33101

cc: Mr. Jack R. Newman, Esquire  
Lowenstein, Newman, Reis & Axelrad  
1025 Connecticut Avenue, N. W.  
Suite 1214  
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Environmental & Urban Affairs Library  
Florida International University  
Miami, Florida 33199

Docket No. 50-335

Florida Power & Light Company  
ATTN: Dr. Robert E. Uhrig  
Vice President  
Nuclear and General Engineering  
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Miami, Florida 33101

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Norman A. Coll, Esquire  
McCarthy, Steel, Hector & Davis  
14th Floor, First National Bank Building  
Miami, Florida 33131

Indian River Junior College Library  
3209 Virginia Avenue  
Ft. Pierce, Florida 33450

Docket No. 50-302

Mr. W. P. Stewart  
Director, Power Production  
Florida Power Corporation  
P. O. Box 14042, Mail Stop C-4  
St. Petesburg, Florida 33733

cc: Mr. S. A. Brandimore  
Vice President and General Counsel  
P. O. Box 14042  
St. Petersburg, Florida 33733

Crystal River Public Library  
Crystal River, Florida 32629

Docket No. 50-321

Georgia Power Company  
Oglethorpe Electric Membership Corporation  
Municipal Electric Association of Georgia  
City of Dalton, Georgia  
ATTN: Mr. Charles F. Whetmer  
Vice President - Engineering  
Georgia Power Company  
Atlanta, Georgia 30302

cc: Ruble A. Thomas  
Vice President  
P. O. Box 2625  
Southern Services, Inc.  
Birmingham, Alabama 35202

Mr. Harry Majors  
Southern Services, Inc.  
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Birmingham, Alabama 35202

Mr. L. T. Gucwa  
Georgia Power Company  
Engineering Department  
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Atlanta, Georgia 30302

Mr. C. P. Moore  
Georgia Power Company  
Production Department  
P. O. Box 4545  
Atlanta, Georgia 30302

Appling County Public Library  
Parker Street  
Baxley, Georgia 31513

Docket No. 50-315

Indiana & Michigan Electric Company  
Indiana & Michigan Power Company  
ATTN: Mr. John Tillinghast  
Vice President

P. O. Box 18  
Bowling Green Station  
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cc: Mr. Robert Hunter  
Vice President  
American Electric Power Service  
Corporation  
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New York, New York 10004

Gerald Charnoff, Esquire  
Shaw, Pittman, Potts & Trowbridge  
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Washington, D. C. 20036

Donald Cook Nuclear Plant  
ATTN: Mr. D. Shaller  
Plant Manager  
P. O. Box 458  
Bridgman, Michigan 49106

Mr. David Dinsmore Comey  
Executive Director  
Citizens for a Better Environment  
59 East Van Buren Street  
Chicago, Illinois 60605

Maude Reston Palenske Memorial Library  
500 Market Street  
St. Joseph, Michigan 49085

Docket No. 50-331

Iowa Electric Light & Power Company  
ATTN: Mr. Duane Arnold  
President  
P. O. Box 351  
Cedar Rapids, Iowa 52406

cc: Cedar Rapids Public Library  
426 Third Avenue, S. E.  
Cedar Rapids, Iowa 52401

Docket No. 50-219

Jersey Central Power & Light Company  
ATTN: Mr. I. R. Finfrock, Jr.  
Vice President - Generation  
Madison Avenue at Punch Bowl Road  
Morristown, New Jersey 07960

cc: Steven P. Russo, Esquire  
248 Washington Street  
P. O. Box 1060  
Toms River, New Jersey 08753

Jersey Central Power & Light Company  
ATTN: Mr. T. Gary Broughton  
Safety and Licensing Manager  
GPU Service Corporation  
260 Cherry Hill Road  
Parsippany, New Jersey 07054

Honorable Joseph W. Ferraro, Jr.  
Deputy Attorney General  
State of New Jersey  
Department of Law & Public Safety  
Consumer Affairs Section  
1100 Raymond Boulevard  
Newark, New Jersey 07102

Ocean County Library  
Brick Township Branch  
401 Chambers Bridge Road  
Brick Town, New Jersey 08723



Docket No. 50-289

Metropolitan Edison Company

ATTN: Mr. J. G. Herbein

Vice President

P. O. Box 542

Reading, Pennsylvania 19603

cc: GPU Service Corporation

Richard W. Heward, Project Manager

Mr. T. Gary Broughton, Safety and

Licensing Manager

260 Cherry Hill Road

Parsippany, New Jersey 07054

Pennsylvania Electric Company

Mr. R. W. Conrad

Vice President, Generation

1001 Broad Street

Johnstown, Pennsylvania 15907

Miss Mary V. Southard, Chairman

Citizens for a Safe Environment

P. O. Box 405

Harrisburg, Pennsylvania 17108

Government Publications Section

State Library of Pennsylvania

Box 1601 (Education Building)

Harrisburg, Pennsylvania 17126

Docket No. 50-298

Nebraska Public Power District  
ATTN: Mr. J. M. Pilant, Director  
Licensing and Quality Assurance  
P. O. Box 499  
Columbus, Nebraska 68601

cc: Mr. G. D. Watson, General Counsel  
Nebraska Public Power District  
P. O. Box 499  
Columbus, Nebraska 68601

Mr. Arthur C. Gehr, Attorney  
Snell & Wilmer  
400 Security Building  
Phoenix, Arizona 85004

Cooper Nuclear Station  
ATTN: Mr. L. Lessor  
Station Superintendent  
P. O. Box 98  
Brownville, Nebraska 68321

Auburn Public Library  
118 - 15th Street  
Auburn, Nebraska 68305

Docket No. 50-220

Niagara Mohawk Power Corporation  
ATTN: Mr. D. P. Dise  
Vice President - Engineering  
300 Erie Boulevard West  
Syracuse, New York 13202

cc: Eugene B. Thomas, Jr., Esquire  
LeBoeuf, Lamb, Leiby & MacRae  
1757 N Street, N. W.  
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Oswego County Office Building  
46 E. Bridge Street  
Oswego, New York 13126

Docket Nos. 50-245  
and 50-336

Northeast Nuclear Energy Company  
ATTN: Mr. D. C. Switzer  
President  
P. O. Box 270  
Hartford, Connecticut 06101

cc: William H. Cuddy, Esquire  
Day, Berry & Howard  
Counselors at Law  
One Constitution Plaza  
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Northeast Nuclear Energy Company  
ATTN: Superintendent  
Millstone Plant  
P. O. Box 128  
Waterford, Connecticut 06385

Waterford Public Library  
Rope Ferry Road, Route 156  
Waterford, Connecticut 06385

Docket Nos. 50-282  
and 50-306

Northern States Power Company  
ATTN: Mr. L. O. Mayer, Manager  
Nuclear Support Services  
414 Nicollet Mall - 8th Floor  
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cc: Mr. F. P. Tierney  
Plant Manager  
Prairie Island Nuclear Generating Plant  
Northern States Power Company  
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Jocelyn F. Olson, Esquire  
Special Assistant Attorney General  
Minnesota Pollution Control Agency  
1935 West County Road B-2  
Roseville, Minnesota 55113

Mr. Robert L. Nybo, Jr., Chairman  
Minnesota-Wisconsin Boundary Area Commission  
619 Second Street  
Hudson, Wisconsin 54016

The Environmental Conservation Library  
Minneapolis Public Library  
300 Nicollet Mall  
Minneapolis, Minnesota 55401

Docket No. 50-263

Northern States Power Company  
ATTN: Mr. L. O. Mayer, Manager  
Nuclear Support Services  
414 Nicollet Mall - 8th Floor  
Minneapolis, Minnesota 55401

cc: Arthur Renquist, Esquire  
Vice President - Law  
Northern States Power Company  
414 Nicollet Mall  
Minneapolis, Minnesota 55401

Mr. L. R. Eliason  
Plant Manager  
Monticello Nuclear Generating Plant  
Northern States Power Company  
Monticello, Minnesota 55362

Russell J. Hatling, Chairman  
Minnesota Environmental Control  
Citizens Association (MECCA)  
Energy Task Force  
144 Melbourne Avenue, S. E.  
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Mr. Kenneth Dzugan  
Environmental Planning Consultant  
Office of City Planner  
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Sandra S. Gardebring  
Executive Director  
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Mr. Steve Gadler  
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St. Paul, Minnesota 55108

The Environmental Conservation Library  
Minneapolis Public Library  
300 Nicollet Mall  
Minneapolis, Minnesota 55401

Docket No. 50-285

Omaha Public Power District  
ATTN: Mr. Theodore E. Short  
Division Manager - Production Operations  
1623 Harney Street  
Omaha, Nebraska 68102

cc: Margaret R. A. Pardis  
LeBoeuf, Lamb, Leiby & MacRae  
1757 N Street, N. W.  
Washington, D. C. 20036

Blair Public Library  
1665 Lincoln Street  
Blair, Nebraska 68008

Docket No. 50-133

Pacific Gas and Electric Company  
ATTN: Mr. John C. Morrissey  
Vice President and  
General Counsel  
77 Beale Street  
San Francisco, California 94106

cc: Philip A. Crane, Jr.  
Pacific Gas and Electric Company  
77 Beale Street  
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Mr. James Hanchett  
Public Information Officer  
Region V - IE  
U. S. Nuclear Regulatory Commission  
1990 N. California Boulevard  
Walnut Creek, California 94596

Humboldt County Library  
636 F Street  
Eureka, California 95501

Docket Nos. 50-277  
and 50-278

Philadelphia Electric Company  
ATTN: Mr. Edward S. Bauer, Jr., Esquire  
Vice President and General Counsel  
2301 Market Street  
Philadelphia, Pennsylvania 19101

cc: Eugene Bradley  
Philadelphia Electric Company  
Assistant General Counsel  
2301 Market Street  
Philadelphia, Pennsylvania 19101

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Assistant Attorney General  
Department of Natural Resources  
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Philadelphia Electric Company  
ATTN: Mr. W. T. Ullrich  
Peach Bottom Atomic  
Power Station  
Delta, Pennsylvania 17314

Martin Memorial Library  
159 E. Market Street  
York, Pennsylvania 17401

Mr. M. J. Cooney, Superintendent  
Generation Division - Nuclear  
Philadelphia Electric Company  
2301 Market Street  
Philadelphia, Pennsylvania 19101

Docket No. 50-344

Portland General Electric Company  
ATTN: Mr. Charles Goodwin, Jr.  
Assistant Vice President  
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Portland, Oregon 97205

cc: Mr. H. H. Phillips  
Portland General Electric Company  
621 Southwest Alder Street  
Electric Building  
Portland, Oregon 97205

Warren Hastings, Esquire  
Phillips, Coughlin, Buell  
Stoloff and Black  
807 Electric Building  
Portland, Oregon 97205

Mr. J. L. Frewing, Manager  
Generation Licensing and Analysis  
Portland General Electric Company  
621 Southwest Alder Street  
Portland, Oregon 97205

Columbia County Courthouse  
Law Library, Circuit Court Room  
St. Helens, Oregon 97051

Docket No. 50-333

Power Authority of the State  
of New York

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Chief Engineer

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New York, New York 10019

cc: Lewis R. Bennett, General Counsel  
Power Authority of the State of New York  
10 Columbus Circle  
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Rear Admiral Paul J. Early  
Assistant Chief Engineer - Projects  
Power Authority of the State of New York  
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Manager-Nuclear Operations  
Power Authority of the State of New York  
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J. D. Leonard, Jr., Resident Manager  
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Director, Technical Development  
Programs  
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Scott B. Lilly, General Counsel  
Power Authority of the State of New York  
10 Columbus Circle  
New York, New York 10019

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Oswego, New York 13126



Docket No. 50-272

Public Service Electric & Gas Company  
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General Manager - Electric Production  
Production Department  
80 Park Place, Room 7221  
Newark, New Jersey 07101

cc: Richard Fryling, Jr., Esquire  
Assistant General Counsel  
Public Service Electric & Gas Company  
80 Park Place  
Newark, New Jersey 07101

Troy B. Conner, Jr., Esquire  
1747 Pennsylvania Avenue, N. W.  
Washington, D. C. 20006

Gene Fisher  
Bureau Chief  
Bureau of Radiation Protection  
380 Scotts Road  
Trenton, New Jersey 08628

State House Annex  
ATTN: Deputy Attorney General  
State of New Jersey  
36 West State Street  
Trenton, New Jersey 08625

Attorney General  
Department of Law & Public Safety  
State House Annex  
Trenton, New Jersey 08625

Public Service Electric & Gas Company  
ATTN: Herbert J. Heller  
Manager, Salem Nuclear Generating  
Station  
Hancocks Bridge, New Jersey 08038

Salem Free Library  
112 West Broadway  
Salem, New Jersey 08079

Public Service Electric & Gas Company  
ATTN: R. L. Mittl  
General Manager - Licensing  
and Environment  
80 Park Place  
Newark, New Jersey 07101

Docket No. 50-244

Rochester Gas & Electric Corporation  
ATTN: Mr. Leon D. White, Jr.  
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Docket No. 50-312

Sacramento Municipal Utility District  
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Business and Municipal Department  
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Docket No. 50-206

Southern California Edison Company  
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Docket Nos. 50-259  
50-260  
and 50-296

Tennessee Valley Authority  
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Docket Nos. 50-280  
and 50-281

Virginia Electric & Power Company  
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Docket Nos. 50-266  
and 50-301

Wisconsin Electric Power Company  
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Docket No. 50-305

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Docket No. 50-29

Yankee Atomic Electric Company  
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cc: Mr. Donald G. Allen, President  
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Docket No. 50-271

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Docket No. 50-309

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Stockton Springs, Maine 04981

Questionnaire  
for  
NUCLEAR REGULATORY COMMISSION  
RELIABILITY STUDY

of  
Standby Diesel Generator Units

Date Questionnaire Completed: \_\_\_\_\_

Plant Name: \_\_\_\_\_ Unit No. \_\_\_\_\_

Diesel Manufacturer: \_\_\_\_\_ Model: \_\_\_\_\_

Number of Units: \_\_\_\_\_

Size Kw/Unit: \_\_\_\_\_ Rated Speed: \_\_\_\_\_

Average Operating Hours Per Unit to Date: \_\_\_\_\_

DIESEL GENERATOR STATUS

A. Engine:

1. Problems are caused chiefly by (give estimated number)
  - a. Defective parts \_\_\_\_\_
  - b. Installation errors: \_\_\_\_\_
  - c. Failure of system to respond properly in function or sequence: \_\_\_\_\_
  - d. Faulty adjustment: \_\_\_\_\_
2. Would more stringent inspection and testing requirements during acceptance or preoperational tests significantly improve the diesel-generator power plant performance?  
Yes \_\_\_\_\_ No \_\_\_\_\_

B. Starting Systems (indicate which):

1. Air-to-cylinder cranking. \_\_\_\_\_  
Air cranking motor \_\_\_\_\_ Mfr. \_\_\_\_\_ Model No. \_\_\_\_\_  
Electric cranking motor \_\_\_\_\_ Mfr. \_\_\_\_\_ Model No. \_\_\_\_\_



2. If air cranking, then:

Give size of starting air tank: Length \_\_\_\_\_ Diameter \_\_\_\_\_

Normal standby air tank pressure \_\_\_\_\_ psi.

Is pressure reducer used? Yes \_\_\_\_\_ No \_\_\_\_\_

Reducer pipe size? \_\_\_\_\_ inches.

Starting air control admission valve pipe size in air piping system, \_\_\_\_\_ inches.

Minimum air tank pressure for engine cranking \_\_\_\_\_ psi.

Number of five-second cranking periods between above pressures with no tank recharging \_\_\_\_\_.

Number of air tanks per engine \_\_\_\_\_.

Can starting air tanks serve more than one engine?

Yes \_\_\_\_\_ No \_\_\_\_\_

Is air pipe to engine from top of air tank? Yes \_\_\_\_\_ No \_\_\_\_\_

Does starting air tank have water condensate drain?

Yes \_\_\_\_\_ No \_\_\_\_\_

Does starting air pipe have water condensate trap and drain near engine? Yes \_\_\_\_\_ No \_\_\_\_\_

Is starting air piping horizontal? Yes \_\_\_\_\_ No \_\_\_\_\_

Does it slant toward drain? Yes \_\_\_\_\_ No \_\_\_\_\_

If water condensate drains are provided, then is draining:

a. Automatic through float valve? Yes \_\_\_\_\_ No \_\_\_\_\_

b. Manual by hand valve? Yes \_\_\_\_\_ No \_\_\_\_\_

c. If manual, then is draining water condensate done:

daily? \_\_\_\_\_  
weekly? \_\_\_\_\_  
monthly? \_\_\_\_\_  
before each start if manual? \_\_\_\_\_  
no procedure? \_\_\_\_\_

Is dirt and rust filter provided in starting air pipe?  
Yes \_\_\_\_\_ No \_\_\_\_\_

If provided, where installed? \_\_\_\_\_  
\_\_\_\_\_

How is it cleaned? \_\_\_\_\_

How often and when? \_\_\_\_\_

Give pipe size of filter: \_\_\_\_\_ inches.

How is it known whether filter is plugged or has high pressure drop? \_\_\_\_\_  
\_\_\_\_\_

Is starting air pipe to engine positioned:

- a. Below floor? \_\_\_\_\_
- b. On the floor? \_\_\_\_\_
- c. Overhead? \_\_\_\_\_

What is air pressure drop from air tank to engine during cranking \_\_\_\_\_ psi

Give approximate length (nearest ten feet) of starting air pipe for individual engine or all engines from air tank to:

- a. Nearest engine \_\_\_\_\_ feet
- b. Furthest engine \_\_\_\_\_ feet

Diameter of starting air pipe from:

- a. Air tank to starting valve \_\_\_\_\_ inches
- b. At air starting valve \_\_\_\_\_ inches
- c. At engine \_\_\_\_\_ inches

What is the primary source of power for the starting air system? \_\_\_\_\_

Is there a duplicate and redundant motor and air compressor set? Yes \_\_\_\_ No \_\_\_\_

What is the time required to recharge one air tank?  
\_\_\_\_\_ minutes

Does starting air supply system have independent secondary power supply for compressor? Yes \_\_\_\_ No \_\_\_\_

If yes, then by:

- a. Gasoline engine? \_\_\_\_\_
- b. Motor driven? \_\_\_\_\_
- c. Other? (Specify) \_\_\_\_\_

3. If electric (Battery powered) cranking, then:

- a. Battery charging: Continuous trickle charger \_\_\_\_\_  
Intermittent charging \_\_\_\_\_

If so, how is charging requirement determined?

Time cycle \_\_\_\_\_  
Test \_\_\_\_\_  
Other \_\_\_\_\_

- b. Battery used: Common Plant \_\_\_\_\_  
Individual Unit \_\_\_\_\_  
Other \_\_\_\_\_

Starting cable size \_\_\_\_\_ ; Length: Battery to engine  
(longest) \_\_\_\_\_

C. Fuel Oil System: Bulk Tank to Day Tank

1. Does the bulk tank to day tank fuel supply system (viz: pump, motor, etc.) have redundant independent power supplies? Yes ☐ No ☐

Does this system have a hand-operated emergency fuel pump? Yes ☐ No ☐

If yes, is this hand-operated pump and piping in immediate operating condition? Yes ☐ No ☐

2. Is there a water and sediment drain from the very bottom of the:

a. Bulk tank? Yes ☐ No ☐

b. Day tank? Yes ☐ No ☐

3. Is the regular functional fuel oil outlet slightly above (two to three inches) the bottom of the:

a. Bulk tank? Yes ☐ No ☐

b. Day or integral tank? Yes ☐ No ☐

4. Is bottom of day tank and/or integral tank above all parts and piping of the engine fuel injection systems?  
Yes ☐ No ☐

If yes,

Give approximate amount inches  feet

5. Does the engine fuel system have a fuel bleed return line to the fuel day tank and/or integral tank?  
Yes ☐ No ☐

During extended operation, such as more than two to three hours, does the fuel in the day tank become: (yes or no)

a. Warm? ☐

b. Hot? ☐ (above 130°F)

What is fuel oil return line size (nominal)?

- a. Pipe size \_\_\_\_\_ inches
  - b. Tubing size \_\_\_\_\_ inches
6. Do engine fuel oil filters have air bleed or vent valves readily accessible? Yes \_\_\_\_\_ No \_\_\_\_\_
7. How is fuel transferred from day tank to engine fuel system?
- a. By gravity \_\_\_\_\_
  - b. Engine driven pump \_\_\_\_\_
  - c. Electric motor driven pump \_\_\_\_\_
  - d. Is a manual pump also provided for injection system filling and/or air venting after servicing or replacement of parts in the fuel injection system? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, is the manual pump in immediate operating condition?  
Yes \_\_\_\_\_ No \_\_\_\_\_

8. Type of fuel (e.g., #1, #2, #3, JP-4, etc.) \_\_\_\_\_.
9. Approximate bulk tank capacity, \_\_\_\_\_ gallons.
10. Typical frequency of refilling (weekly, monthly, etc.) \_\_\_\_\_.
11. Typical refill (gallons), \_\_\_\_\_.

D. Lube Oil System

1. Lube oil
- a. Type \_\_\_\_\_
  - b. Viscosity \_\_\_\_\_
  - c. Specification number \_\_\_\_\_
  - d. Oil change determined by:
    - Time interval: Yes \_\_\_\_\_ No \_\_\_\_\_
    - Give interval \_\_\_\_\_ monthly, yearly
    - By oil analysis: Yes \_\_\_\_\_ No \_\_\_\_\_

2. Lube oil filters are:

- a. Full flow \_\_\_\_\_
- b. Bypass \_\_\_\_\_
- c. Combination \_\_\_\_\_

3. Interval and/or basis for changing filter cartridge:

- a. Monthly \_\_\_\_\_
- b. Yearly \_\_\_\_\_
- c. By running time \_\_\_\_\_ hours
- d. By oil analysis. Yes \_\_\_\_\_ No \_\_\_\_\_
- e. By pressure drop. Yes \_\_\_\_\_ No \_\_\_\_\_
- f. Does provisions exist for changing cartridges during engine operation? Yes \_\_\_\_\_ No \_\_\_\_\_

4. Oil Pressure Monitoring

- a. Normal operating pressure \_\_\_\_\_ psi
- b. Alarm \_\_\_\_\_ psi
- c. Shutdown \_\_\_\_\_ psi

5. Oil temperature control:

- a. By standby heater in engine sump \_\_\_\_\_ °F.
- b. Heating means for maintaining standby temperature:

Direct in oil \_\_\_\_\_  
Oil-to-water heat exchanger \_\_\_\_\_  
Other (Specify) \_\_\_\_\_

E. Cooling System - Engine Water

1. Temperature control by:

- a. By thermostat in water? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, then:

Bypass thermostat? Yes \_\_\_\_\_ No \_\_\_\_\_  
Throttle thermostat? Yes \_\_\_\_\_ No \_\_\_\_\_

b. By radiator shutter:

Automatic \_\_\_\_\_

Manual \_\_\_\_\_

Other (give type) \_\_\_\_\_

2. Corrosion control (water additive)? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, give chemical additive or name of compound.

Proportion or concentration control:

a. By additive measurement? Yes \_\_\_\_\_ No \_\_\_\_\_

b. By water coolant analysis? Yes \_\_\_\_\_ No \_\_\_\_\_

3. Engine cooling water cooled by:

a. Radiator? \_\_\_\_\_

b. Heat exchanger from sea, river or other water? \_\_\_\_\_

c. Other? (give type) \_\_\_\_\_

4. Engine cooling water temperature-monitoring

a. Standby temperature \_\_\_\_\_ °F

b. Normal operating temperature \_\_\_\_\_ °F

c. Alarm temperature \_\_\_\_\_ °F

d. Shutdown temperature \_\_\_\_\_ °F

e. Water circulation during standby:

Thermo-syphon \_\_\_\_\_

Pump \_\_\_\_\_

5. Water Pressure Monitoring: Yes \_\_\_\_\_ No \_\_\_\_\_

a. Alarm \_\_\_\_\_

b. Shutdown \_\_\_\_\_

c. Both \_\_\_\_\_

6. Water temperature Sensor Position:

- a. In piping from engine \_\_\_\_\_
- b. In engine piping \_\_\_\_\_
- c. In engine direct \_\_\_\_\_

7. Water surge or supply tank in system. Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, then bottom connected to:

- a. Water pump suction? Yes \_\_\_\_\_ No \_\_\_\_\_
- b. Top of system? Yes \_\_\_\_\_ No \_\_\_\_\_
- c. Both of above? Yes \_\_\_\_\_ No \_\_\_\_\_
- d. Is bottom of surge tank above top of engine system? Yes \_\_\_\_\_ No \_\_\_\_\_
- e. Does engine have constant air bleed from top of engine water piping to surge or supply tank?  
Yes \_\_\_\_\_ No \_\_\_\_\_
- f. Give size of bleed or vent line, \_\_\_\_\_ inches.
- g. Manual air bleed only? Yes \_\_\_\_\_ No \_\_\_\_\_

F. Governor - Speed Control

Manufacturer \_\_\_\_\_

Electric (speed sensing) \_\_\_\_\_

Hydraulic \_\_\_\_\_

Type or code (such as EGB-35, LSG-10, etc.) \_\_\_\_\_

Automatic load sharing? Yes \_\_\_\_\_ No \_\_\_\_\_

1. Is compensation or stability control and/or speed of response manually adjustable? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, adjusted by:

- a. Eye and ear?
- b. Test and specification? \_\_\_\_\_
- c. Other? (Specify) \_\_\_\_\_.

2. Engine - generator normal shutdown or stopping means and method.



Is the engine stopped:

a. Manually? Yes \_\_\_\_ No \_\_\_\_

If yes, then:

Directly at engine? Yes \_\_\_\_ No \_\_\_\_

Through local control panel? Yes \_\_\_\_ No \_\_\_\_

b. Automatically through the controls in the control room? Yes \_\_\_\_ No \_\_\_\_

c. By setting governor to "fuel-off" position? Yes \_\_\_\_ No \_\_\_\_

d. By over-ride of governor settings and control position directly to fuel injection pumps? Yes \_\_\_\_ No \_\_\_\_

e. Other means. Describe briefly. \_\_\_\_\_

3. When engine is stopped, is fuel control in:

a. Full fuel or maximum fuel position? \_\_\_\_

b. Full off or no fuel position? \_\_\_\_

c. Intermediate? \_\_\_\_

d. Random? \_\_\_\_

(If not consistent and typical in above, then give the usual.)

4. When starting from the standby condition after shutdown for at least 24 hours, give number of seconds from start-to-crank to full fuel or maximum fuel position of governor and fuel control, \_\_\_\_\_ seconds.

G. Governor - Overspeed (shutdown)

1. Speed sensing?

- a. Electrical \_\_\_\_\_
- b. Flyball \_\_\_\_\_
- c. Other (Specify) \_\_\_\_\_

2. Fuel shutoff force generated by:

- a. Spring? \_\_\_\_\_
- b. Air? \_\_\_\_\_
- c. Hydraulic? \_\_\_\_\_
- d. Electrical? \_\_\_\_\_
- e. Other? (Specify) \_\_\_\_\_

3. Overspeed sensing setting? (in terms of full speed)

- a. 115% \_\_\_\_\_
- b. 110% \_\_\_\_\_
- c. Other (Specify) \_\_\_\_\_

4. Is overspeed tripping set point tested periodically?

Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, then how often? \_\_\_\_\_ (yearly, monthly, etc.)

- H. 1. Generator Mfr. \_\_\_\_\_ Model No. \_\_\_\_\_  
Single bearing or two bearings? \_\_\_\_\_  
Does generator have damper windings? Yes \_\_\_\_\_ No \_\_\_\_\_

2. Does generator have any obvious fault or difficulty?

Yes \_\_\_\_\_ No \_\_\_\_\_

Is problem repetitive? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, then describe briefly. \_\_\_\_\_

I. Exciter and Voltage Regulator

1. Exciter Manufacturer: \_\_\_\_\_ Model \_\_\_\_\_

Type: Rotating \_\_\_\_\_ Static \_\_\_\_\_

If rotating drive? Direct \_\_\_\_\_  
Belt or Chain \_\_\_\_\_  
DC with field control \_\_\_\_\_  
Brushless with rectifier \_\_\_\_\_

2. Voltage Regulator: Manufacturer \_\_\_\_\_ Model \_\_\_\_\_

Type: Mechanical \_\_\_\_\_ Static \_\_\_\_\_

3. Are paralleled units of automatic load sharing control  
of fully automatic type? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, has any obvious influence or interrelationship  
been noted between the stability and response time of  
the engine governor and the stability and voltage control  
of the generators? Yes \_\_\_\_\_ No \_\_\_\_\_

4. Have engine governor and voltage regulator/exciter  
adjustments been made on the site or under any con-  
ditions since any of the units have been placed in  
service? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, by means of what tests and what standards?  
Give name or very brief description. \_\_\_\_\_

5. If any difficulties have occurred, give approximate  
number of problems.

- a. Components \_\_\_\_\_
- b. Wiring \_\_\_\_\_
- c. Other (damage in service or dropping of miscellaneous  
hardware into switchboard, etc.) \_\_\_\_\_.

J. Paralleling: Engine-Generator Units

1. Do all units consistently have the proper voltage output?  
Yes \_\_\_\_ No \_\_\_\_
2. Do all units automatically share both the "real" or in-phase load and also the reactive load reasonably well? Yes \_\_\_\_ No \_\_\_\_
3. At the same Kw load, are both the field and the armature line currents of the several units consistently close to the same value? Yes \_\_\_\_ No \_\_\_\_

If no, approximate percent difference. \_\_\_\_\_

4. Synchronizing

- a. In automatic synchronizing do circuit breakers close immediately after reaching full synchronous speed?  
Yes \_\_\_\_ No \_\_\_\_
- b. If "no" above then, does speed of some units drift slowly while failing to synchronize and close circuit breakers?

How many seconds? \_\_\_\_\_

Occasionally \_\_\_\_\_

Always \_\_\_\_\_

Never \_\_\_\_\_

K. Switch Gear and Electrical Con. (other than exciter/  
voltage regulator)

1. If any difficulties have occurred, then give approximate number of problems.
  - a. Components \_\_\_\_\_
  - b. Wiring \_\_\_\_\_
  - c. Other (damage in service or dropping of miscellaneous hardware into switchboard, etc.) \_\_\_\_\_
  - d. Design concept faults. That is, does the switch gear and its controls perform the proper functions and in proper sequence and timing. \_\_\_\_\_

2. a. Do the on-site diesel generator units and related support equipment have any storage battery power systems for any service whatsoever? Yes \_\_\_\_ No \_\_\_\_
- b. Identify each storage battery power system associated with the on-site diesel generator unit and its function. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- c. Does each system identified above adequately fulfill the service requirements for which it is intended? Yes \_\_\_\_ No \_\_\_\_  
If no, briefly describe. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- d. Is there a DG battery maintenance program? Yes \_\_\_\_ No \_\_\_\_

L. Safety Shut downs

Give safety shut down settings compared to equilibrium operating conditions.

1. Engine and generator speed. Give rpm or hertz:
  - a. Synchronous and usual \_\_\_\_\_ rpm or \_\_\_\_\_ Hz
  - b. Overspeed shutdown setting \_\_\_\_\_ rpm or \_\_\_\_\_ Hz
2. Engine cooling water (see E.4)
  - a. Equilibrium \_\_\_\_\_ °F
  - b. Alarm \_\_\_\_\_ °F
  - c. Shut down \_\_\_\_\_ °F
3. Lube oil pressure (see D.4)
  - a. Equilibrium \_\_\_\_\_ psi
  - b. Alarm \_\_\_\_\_ psi
  - c. Shut down \_\_\_\_\_ psi

4. Lube oil temperature

- a. Equilibrium \_\_\_\_\_ °F
- b. Alarm \_\_\_\_\_ °F
- c. Shutdown \_\_\_\_\_ °F

5. Indicate all other protective interlocks (give name and;)

- a. Usual or proper condition \_\_\_\_\_  
\_\_\_\_\_
- b. Shutdown condition \_\_\_\_\_  
\_\_\_\_\_

6. a. What source of power is provided to operate alarms and shutdown controls? (See G.2) \_\_\_\_\_

- b. Do the generator units automatically shutdown in case of the electrical power loss to its control system? Yes \_\_\_\_ No \_\_\_\_

M. Emergency or Alert Conditions

- 1. Are all safety shutdown and safety interlocks bypassed during emergency conditions? Yes \_\_\_\_ No \_\_\_\_
- 2. If "no" above, then which are not bypassed. Name items.  
\_\_\_\_\_  
\_\_\_\_\_

- 3. For each interlock not bypassed is coincident logic used? Yes \_\_\_\_ No \_\_\_\_

If yes, is it testable? Yes \_\_\_\_ No \_\_\_\_

N. Maintenance

- 1. Does plant have regularly scheduled maintenance procedures? \_\_\_\_\_

If so, return copy of these procedures with questionnaire.

2. When need for minor adjustments obviously exists, then:

- a. Is remedial action taken immediately or at earliest practical opportunity? Yes \_\_\_\_ No \_\_\_\_
- b. Is remedial action taken only at periodic prescheduled or programmed times and conditions? Yes \_\_\_\_ No \_\_\_\_
- c. For best performance record which of above appears better:  
  
immediate or early action? \_\_\_\_  
as scheduled only? \_\_\_\_
- d. Must permission for minor maintenance be obtained from some higher out-of-plant authority? Yes \_\_\_\_ No \_\_\_\_
- e. Is maintenance referred to above allowed and encouraged? Yes \_\_\_\_ No \_\_\_\_
- f. In periodic surveillance tests, simulated alert standby tests, etc., is the criteria "pass/not pass" the test used? Yes \_\_\_\_ No \_\_\_\_
- g. Is there a conscious continuing policy to detect and remedy marginal conditions or imminent trouble: for examples: lube oil pressure shutdown only two to five psi below operating pressure or, perhaps overspeed governor setting only one or two percent above starting speed surge or etc.? Yes \_\_\_\_ No \_\_\_\_
- h. Are efforts to remedy marginal or questionable conditions as mentioned above encouraged by plant management? \_\_\_\_  
  
Yes \_\_\_\_ No \_\_\_\_
- i. Are remedial steps on items similar to the above taken or allowed when the unit has started and operated satisfactorily within specified limits or conditions? Yes \_\_\_\_ No \_\_\_\_

0. Starting Conditions

1. Give starting or necessary cranking time as experienced.

- a. Starting time per specification \_\_\_\_ seconds
- b. Usual starting time \_\_\_\_ seconds
- c. Maximum starting time observed \_\_\_\_ seconds

2. Give usual time intervals as follows:
  - a. Time from start-to-crank to first firing of any cylinder. \_\_\_\_\_ seconds
  - b. Time from start-to-crank to approximate full firing of all cylinders. \_\_\_\_\_ seconds
3. Give maximum speed surge when starting; use both tachometer and frequency meter if possible.
  - a. Usual conditions \_\_\_\_\_ rpm  
\_\_\_\_\_ Hz
  - b. Maximum observed \_\_\_\_\_ rpm  
\_\_\_\_\_ Hz
4. During a surveillance test, give time from start-to-crank to when steady synchronous speed is attained and maintained.
  - a. Usual \_\_\_\_\_ seconds
  - b. Maximum \_\_\_\_\_ seconds
  - c. As specified \_\_\_\_\_ seconds.
5. Give briefly the most troublesome problems in starting.
  - a. Most troublesome \_\_\_\_\_.
  - b. Next to most troublesome \_\_\_\_\_.

P. Air Cleaner or Air Filter - Combustion Air

1. Combustion air source: taken from engine room or inside the building, or from outdoors?
- a. Indoors \_\_\_\_\_
- b. Outdoors \_\_\_\_\_



2. Give type and make of air cleaners or air filters:

- a. Oil bath \_\_\_\_\_ Make \_\_\_\_\_
- b. Oil wetted screen \_\_\_\_\_ Make \_\_\_\_\_
- c. Paper \_\_\_\_\_ Make \_\_\_\_\_
- d. Other \_\_\_\_\_ Make \_\_\_\_\_
- e. Precleaner: Yes \_\_\_\_\_ No \_\_\_\_\_

3. Excessive air flow restriction and servicing need determined by?

a. Instrument such as:

manometer \_\_\_\_\_  
If other give type \_\_\_\_\_

- b. Personal judgement by appearance, etc. \_\_\_\_\_
- c. By smoking exhaust \_\_\_\_\_
- d. Time schedule \_\_\_\_\_
- e. Other (Specify) \_\_\_\_\_

4. Are climatic extremes normally experienced such as:

- a. Air heavily loaded with water mist, high humidity and low temperature? Yes \_\_\_\_\_ No \_\_\_\_\_
- b. Blowing sand and dust? Yes \_\_\_\_\_ No \_\_\_\_\_
- c. Blowing snow (blizzards)? Yes \_\_\_\_\_ No \_\_\_\_\_
- d. Other-Name \_\_\_\_\_

5. Are climatic extremes potentially possible such as:

- a. Air heavily loaded with water mist, high humidity and low temperature? Yes \_\_\_\_\_ No \_\_\_\_\_
- b. Blowing sand and dust? Yes \_\_\_\_\_ No \_\_\_\_\_
- c. Blowing snow (blizzards)? Yes \_\_\_\_\_ No \_\_\_\_\_
- d. Other-Name \_\_\_\_\_

Q. Temperature Conditions

- 1. Ambient outside hottest \_\_\_\_\_ °F.
- 2. Ambient outside coldest \_\_\_\_\_ °F.
- 3. Engine-generator room hottest \_\_\_\_\_ °F.
- 4. Engine-generator room coldest \_\_\_\_\_ °F.
- 5. Inside switch gear hottest \_\_\_\_\_

R. Operator Qualifications (as presently exists, and suggested minimums if different)

1. Minimum education required (check)

	<u>Existing</u>	<u>Suggested</u>
a. High School	_____	_____
b. Trade School	_____	_____
c. Technical School	_____	_____
d. No minimum	_____	_____

2. Minimum Years of operating experience (diesel electric generator)

	<u>Existing</u>	<u>Suggested</u>
a. 0-3	_____	_____
b. 3-6	_____	_____
c. 6-10	_____	_____
d. 10-15	_____	_____

3. Operator training

	<u>Existing</u>	<u>Suggested</u>
a. Military	_____	_____
b. Industrial	_____	_____
c. On-the-job	_____	_____
d. Combination of a, b, and c (indicate which)	_____	_____

4. Licensing required

	<u>Existing</u>	<u>Suggested</u>
a. State	_____	_____
b. Federal	_____	_____
c. Utility or self	_____	_____
d. None	_____	_____

- S. Are any foreign gases such as propane, freon, halon, carbon dioxide, etc. stored in the: Diesel Engine room?  
Yes \_\_\_\_\_ No \_\_\_\_\_ or adjacent buildings? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, (other than hand portable fire extinguishers), then identify gases and give approximate tank size.

3

Gases	Volume (ft )
_____	_____
_____	_____
_____	_____
_____	_____

- T. Does control system automatically bypass, in emergency starting, any engine temporarily out of service for maintenance? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, then how many failures to bypass have occurred?  
\_\_\_\_\_

- U. Does the control system automatically override the test mode under emergency conditions? Yes \_\_\_\_\_ No \_\_\_\_\_

- V. Have repetitive mechanical failures occurred in any component part or subsystem of the engine, generator, or switch gear, etc.?  
Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, then which part or subsystem? \_\_\_\_\_

How many failures? \_\_\_\_\_

Give nature of failure. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- W. Would periodic (yearly or other) evaluation and/or testing by "outside experts" contribute significantly to the diesel-generator reliability? Yes \_\_\_\_\_ No \_\_\_\_\_

Give brief reasons for the answer. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- X. 1. Give the accumulated time-load operating record for each diesel-generator unit from installation to the present (Running Hours):

Preoperational test Date \_\_\_\_\_

: Engine :	Surv. Testing &	Emergency	Total	:
: Serial No. :	Maintenance Hrs.	and Other	Hours	:
:	No Load : Loaded	Service Hrs.	:	:
:	:	:	:	:
:	:	:	:	:
:	:	:	:	:
:	:	:	:	:
:	:	:	:	:
:	:	:	:	:
:	:	:	:	:

2. Surveillance test load (percent of continuous rating) \_\_\_\_\_
3. Give the projected or planned time-load operation for each diesel-generator unit during the next 12 months.

: Surveillance &	Emergency	Total	:
: Maintenance Hrs.	and other	Hours	:
:	Service Hrs.	:	:
:	:	:	:
:	:	:	:
:	:	:	:

4. Provide the following summary of the periodic surveillance testing experience:

- a. Starting date of surveillance testing (OL date) \_\_\_\_\_
- b. Periodic test interval \_\_\_\_\_
- c. Total number of surveillance tests performed \_\_\_\_\_
- d. Total number of test failures \_\_\_\_\_

failure to start \_\_\_\_\_ failure to accept load \_\_\_\_\_

failure to carry load \_\_\_\_\_ failures due to operator error \_\_\_\_\_

failure due to equipment not being operative during emergency conditions \_\_\_\_\_

- e. Supply a copy of the surveillance test procedures with this completed questionnaire.

Additional Comments

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Y. General Suggestions

Briefly give constructive criticism or suggestions as to improvement in reliability of the diesel generators. These remarks may cover tests, maintenance, practices, orders, policy, adjustments, etc.

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