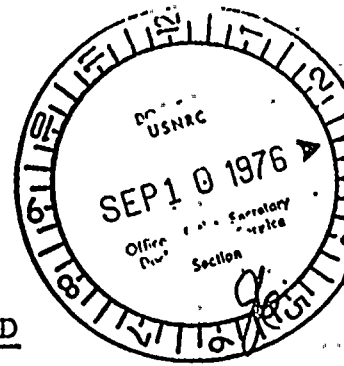


RELATED CORRESPONDENCE

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD



In the Matter of)
PACIFIC GAS AND ELECTRIC COMPANY)
(Diablo Canyon Nuclear Power Plant,)
Units Nos. 1 and 2))

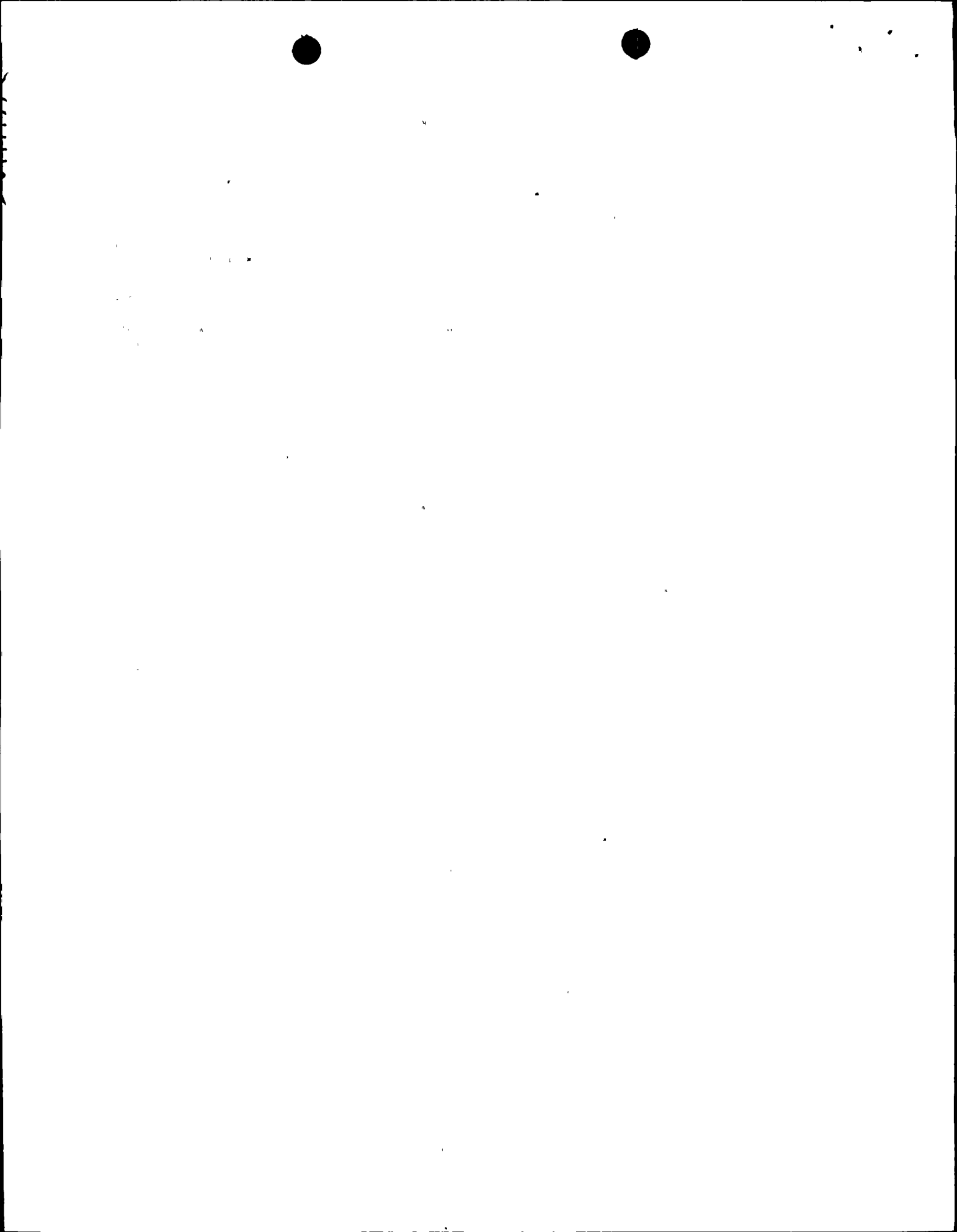
9/8/76

Docket Nos. 50-275 O.L.
50-323 O.L.

AFFIDAVIT OF DALE BRIDENBAUGH

Dale Bridenbaugh deposes and says under oath as follows:

1. I am a graduate engineer thoroughly familiar with operating problems of nuclear generating plants including operating difficulties that could lead to nuclear reactor accidents. I received my B.S. in Mechanical Engineering from the South Dakota School of Mines and Technology in 1953. For the past twenty-two years, until February, 1976, I worked as an engineer with General Electric on all aspects of power generation equipment design, manufacture and operations. During the last ten of those twenty-two years, I worked in management positions in the area of operations of nuclear power plants and solutions to operational problems of those plants. My most recent position at General Electric was Manager - Performance Evaluation and Improvement. My responsibilities in that position included evaluation of the operations of all General Electric - designed nuclear power plants in the world. A complete list of



my training, experience and qualifications as a nuclear power plant engineer accompanies this affidavit as Attachment 1.

2. Based upon my experience as a nuclear plant operations engineer and the intimate familiarity with nuclear power plant operating problems and component capabilities that experience has given me, it is my opinion that a ground acceleration of .75g at the Diablo Canyon plant site that the nearby Hosgri fault can produce could credibly cause serious reactor accidents at the Diablo Canyon power plant. Such an accident would release significant quantities of radionuclides into the atmosphere, resulting in significant adverse impacts on the environment.

3. Seismic events provide a difficult aspect of nuclear power plant design verification. The current Diablo Canyon seismic evaluation is a prime example of the problem imposed by attempting to design to withstand forces that are impossible to fully model and predict, and which cannot be tested in a full scale, integrated system mode.

4. Diablo Canyon was originally given a design basis of 0.4g ground acceleration. The current seismology indicates that a ground acceleration of at least 0.75g at the plant site is credible. This changed level of knowledge regarding seismicity at the Diablo Canyon site places in serious doubt the capabilities of the structures and components of the generating plant, including the control systems, to withstand a major credible seismic event



without breakage or malfunction resulting in a serious reactor accident causing substantial harm to the environment and human health.

5. Current design standards call for multi-frequency, multi-axis, testing or suitable seismic analysis of major components, particularly those in the safety systems. The purpose of such testing is to consider transient loads due to the seismic events and to find the simultaneous effect of the loads from different frequencies and different directions of excitation. Experience has shown that the results of a seismic test of a major reactor component are generally quite different from analytical results and often difficult to reconcile. Plants may be designed to less severe design basis earthquake criteria, and the modeling of the structures may be less sophisticated than new information would require. The result is lower calculated excitation at some locations where safety-related equipment is mounted.

6. The risk that a plant may experience earthquake loads much greater than the original design criteria may be due to any of several causes: (1) inadequate modeling, (2) the effect of combined loads compared to single frequency tests, and (3) design criteria changes after the design basis is set. The discovery of the previously unknown Hosgri fault near Diablo Canyon gives rise to the probability that the design is inadequate. Such inadequacies could result in serious accidents if major earthquakes were to occur. The following is a list of typical accident



scenarios that could result from an earthquake at Diablo Canyon. Many other credible accident scenarios could be developed.

I. Loss Of Coolant Accidents (LOCA)

Loss of coolant accidents are events that must be considered in the standard design basis. However, inadequate seismic design may have a serious effect on plant performance during a LOCA for several reasons:

(a) First, gross movement of the structures and/or components may result in multiple/simultaneous ruptures which exceed the break size considered as the maximum credible in the design basis.

(b) Gross movement of the pressure vessel or of the steam generators may result in ruptures that are not considered credible under normal circumstances; i.e., a rupture of the vessel.

(c) Major seismic events will almost surely be accompanied by loss of off-site power, and may result in loss of on-site emergency power if the seismic basis is inadequate. This will result in the "one-in-a-billion" consequences specified in the Reactor Safety Study.

II. Loss of Control Function

All reactor safety systems are designed to withstand events as specified in IEEE-279, "the single failure criteria." Loss of control of critical systems can result in serious power transients and/or inability of safety systems to provide critical core cooling as designed. Such failures could result in serious core damage and/or meltdown.



III. Gross Structure/Component Failure

Many accident sequences not evaluated in the normal review process could result from seismic events exceeding the general design basis. All such accident sequences would result in major core melting and release of substantial quantities of radioactive materials. A few to consider are:

(a) Containment system failure, resulting in uncontrolled release of materials for any LOCA.

(b) Failure of reactor vessel internals. Such failures would include movement of fuel, interfering with control rod insertion, failure of ECCS components and/or water supply, failure of core barrel support structure resulting in a large reactivity addition transient, etc.

(c) Gross failure of steam generator internals resulting in a LOCA coupled with loss of containment function.

(d) Gross structural failure of control areas. Gross damage to the plant buildings could make personnel access to both the normal and to the remote shutdown control areas impossible or highly hazardous. Such loss of control could lead to a complete core meltdown.

IV. Spent Fuel and Waste Storage Accidents

Inadequate seismic design could lead to serious releases of radioactive material from the radioactive material storage areas. This problem will be particularly acute since no spent fuel reprocessing facilities are likely to



be in operation for the next 6-8 years. This unavailability of reprocessing facilities will increase the on-site inventory of stored fuel and its attendant risk. Credible seismic event-induced accidents of fuel storage areas include:

(a) Failure of spent fuel storage racks collapsing, resulting in an uncontrolled criticality.

(b) Structural damage to the storage pool. Such structural damage could result in leakage of the water and radioactive material to the environs. A gross failure could result in complete loss of water and fuel melting.

(c) Seismic events occurring during fuel handling. These earthquakes could result in dropping of the shipping cask, failure of bridges and highways during fuel transportation, etc. This type of accident could also cause the release of radioactive waste.

7. Most of the plant, including structures, components, systems, and procedures, was designed, manufactured, and constructed to a now-inadequate seismic basis. It is therefore imperative that all the above events, in addition to the normally considered accidents, be given a thorough evaluation before nuclear operation is permitted. Changes must be completed before operation to insure the protection of the environment and the health and

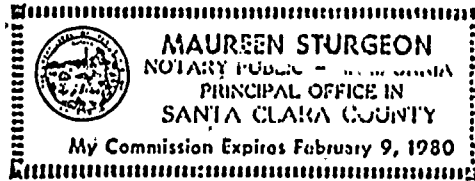


safety of the public.

Dale Bridenbaugh
Dale Bridenbaugh

Subscribed and sworn to
before me this 8 day
of September, 1976.

Maureen Sturgeon
Notary Public



My Commission Expires _____

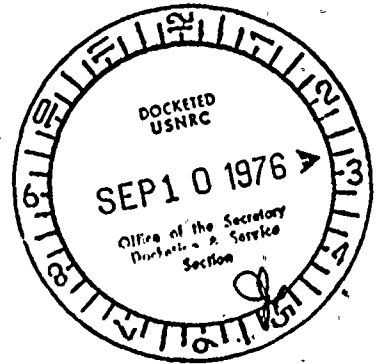
(SEAL)



RESUME

RELATED CORRESPONDENCE

Dale G. Bridenbaugh
2487 Cottle Avenue
San Jose, California 95125
408-265-5061



EXPERIENCE

1973 - 1976

Manager, Performance Evaluation and Improvement, General Electric Company-Nuclear Energy Division, San Jose, California

Responsible for establishment and management of systems to provide for the monitoring and measurement of Boiling Water Reactor equipment and system performance through constant monitoring of operating data; the integration of all Division and field resources in the completion of customer plant modifications; and coordinated action on the part of Division organizations to correct the causes of forced Boiling Water Reactor outages. Management of coordination of efforts of Division organizations to improve the reliability and performance of BWR systems by analysis and improvement, thereby improving the level of business for the Division.

Responsible for development of Division Master Performance Improvement Plan as well as for numerous Staff special assignments on long range studies. Was on special assignment for the management of two different ad hoc projects formed to resolve unique technical problems.

Responsible for the management of 17 technical and 7 clerical personnel.

1972 - 1973

Manager, Product Service, General Electric Company-Nuclear Energy Division, San Jose, California

Responsible for the warranty service, refueling and service planning and performance analysis and service communications functions supporting all completed commercial nuclear power reactors supplied by the company, both domestic and overseas (Europe and Asia). This included responsibility for punchlist and warranty administration and customer liaison for all operating plant activities. Responsibilities included development of operating plant service business opportunities, establishment and operation of a performance feedback information system, and surveillance of operating plants.

Organization consisted of 21 technical and 4 clerical personnel.



1968 - 1972

Manager, Product Service, General Electric Company-Nuclear Energy Division, San Jose, California

Managerial responsibility for all customer contact, planning and execution of work required after the customer acceptance of Department-supplied plants and/or equipment, plus quotation, sale and delivery of spare and renewal parts. Sales volume of parts increased from \$1,000,000 in 1968 to over \$3,000,000 in 1972. Responsible for 16 technical and 6 clerical personnel.

1966 - 1968

Manager, Complaint and Warranty Service, General Electric Company-Nuclear Energy Division, San Jose, California

Managerial and functional responsibility for customer contacts, planning and execution of work required after customer acceptance of Department-supplied plants and/or equipment-- both domestic and overseas. This included complaints, warranty administration and engineering assistance. Managed component of six direct reports.

1963 - 1966

Field Engineering Supervisor, General Electric Company, Installation and Service Engineering Department, Los Angeles, California

Responsible for approximately one-half of GE steam and gas turbine installation and maintenance work in Southern California, Arizona, and Southern Nevada. Supervised approximately eight field representatives. During this period was responsible for the installation of one 44-MW, one 55-MW, one 75-MW, one 100-MW, one 167-MW, one 225-MW, and two 330-MW central station steam turbine generator units, plus much maintenance activity. Work included customer contact, preparation of installation, construction, and maintenance cost estimates, preparation of quotations, and contract negotiations.

1956 - 1963

Field Engineer, General Electric Company, Installation and Service Engineering Department, Chicago, Illinois

Supervised installation and maintenance of steam turbines of all sizes. Supervised crews of from ten to more than 100 men, depending on the job. Worked primarily with large utilities but had significant work with steel, petroleum and other process industries. Had extensive work (four years) at Dresden Nuclear Power Station during construction, startup, trouble-shooting and refueling of the first large-scale commercial nuclear power unit. Was General Electric Site Manager during the 1962/63 Dresden refueling outage, responsible for planning and directing procurement and site repair and construction activity involving in excess of 100 craftsmen for a period of several months.



1955 - 1956

Test Engineer, Engineering Training Program, Steam Turbine Department, General Electric Company, Schenectady, New York

Prepared units for running tests and supervised initial operations. Took an extended assignment for six months to supervise a crew averaging five engineers.

1955

Plant Engineer, Engineering Training Program, Locomotive Department, General Electric Company, Erie, Pennsylvania

Individual engineering work on design and selection of plant facilities for conversion of plant to motor and generator manufacturing line.

1953 - 1955

United States Army - Ordnance School, Aberdeen, Maryland

Instructor - Heavy Artillery Repair. Taught classroom and shop disassembly of artillery pieces for 18 months. Classes were enlisted men and officers of 10 to 20 men.

1953

Test Engineer, Engineering Training Program, Aircraft Gas Turbine, Evendale, Ohio

Individual contributor in design of test facilities for various engine components such as thermocouples, fuel nozzles, etc.

EDUCATION

BSME - 1953 - South Dakota School of Mines and Technology, Rapid City, South Dakota. Upper ¼ of class.

Various Company Training Courses during career including Professional Business Management, Kepner Tregoe Decision Making, Effective Presentation, and numerous technical seminars.

PERSONAL DATA

Born November 20, 1931, Miller, South Dakota

Married, three children.

6'2", 190 lbs., health excellent.

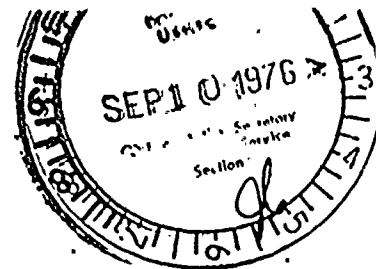
Honorable discharge from U.S. Army.

Hobbies are skiing, hiking, work with Cub and Boy Scout groups.



RELATED CORRESPONDENCE

CERTIFICATE OF SERVICE BY MAIL



The foregoing document entitled AFFIDAVIT OF DALE BRIDENBAUGH has been served today, September 8, 1976 by deposit in the United States mail, properly stamped and addressed:

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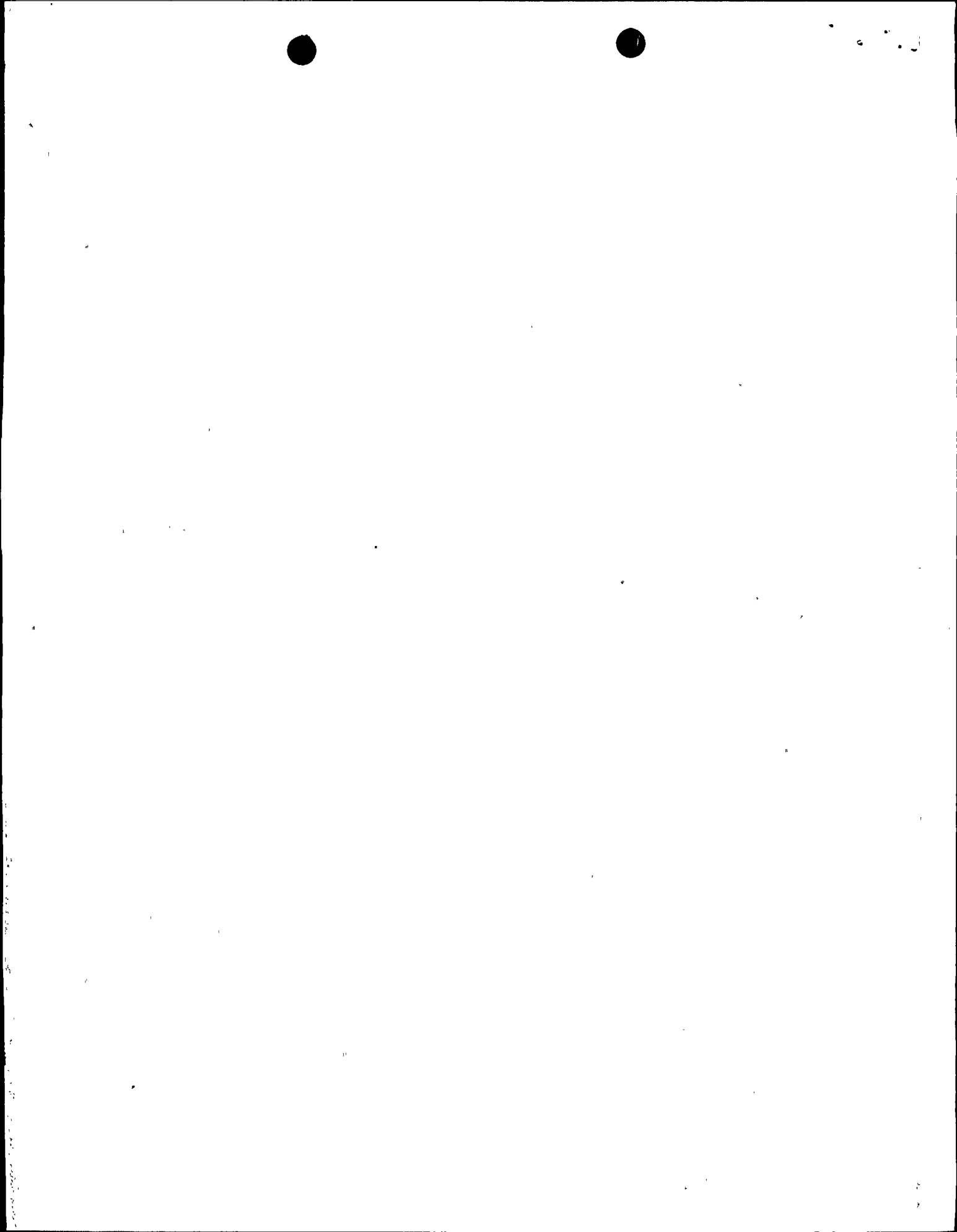
Ms. Raye Fleming
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Secretary
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September 8, 1976


Sally Faubion

