New Brunswick, New Jersey 08903
(201) 845-1300

E.R. Squibb & Sons
United States

April 1, 1986

U. S. Nuclear Regulatory Commission
Nuclear Material Licensing Section
631 Park Avenue
King of Prussia, PA 19406

To Whom It May Concern:

Enclosed are six copies of changes to update E. R. Squibb & Sons Radiological Contingency Plan. Squibb's Byproduct Material License number is 29-00139-02.

Thank you,

D. K. Balkunow
Radiation Safety Officer

DKB/ldl

Enclosure:

Date Issued: 4/02/86

INDEX

Pages To Be Removed		New Pages To Be Issued	
Page Number	Date	Page Number	Date
4	04/01/85	4	01/15/86
12	04/01/85	12	"
12a	03/15/82	12a	"
13	"	13	"
14	04/01/85	14	"
15	"	15	"
16	05/18/82	16	"
17	"	17	"
17a	"	17a	"
17b	"	17b	"
25a	12/04/81	25a	"
26	05/18/82	26	"
27a	12/04/81	27a	"
27b	"	27b	"
38	04/01/85	38	"
39	05/27/83	39	"
42	05/18/82	42	05/18/82
43	04/01/85	43	01/15/86
43a	"	43a	"
43b	"	43b	"
44	"	44	"
44a	"	44a	"
	New Addition	44b	01/15/86
45	"	45	"
45a	"	45a	"
46	"	46	04/01/85
47	"	47	"
48	"	48	"
49	"	49	"
54	"	54	"
	New Addition	54a	01/15/86
61	"	61	"
62	"	62	"
67	NO DATE	67	"
		Ammendment 67 Addendum I	"

Control apparatus consist of steel filter enclosures with particulate filters of varying efficiency and activated carbon filters on the suction side of fans discharging to the stack.

The reduction in the radioactive iodine concentration through the material used at our facility is at a minimum factor of 5 per centimeter of bed depth for radioiodine as methyl iodide at a flow rate of 40 fpm, 70% relative humidity and air temperature of 25 degrees C. For this reason, the theoretical filtration efficiency is approximately 99.9%.

Data accumulated at the Medotopes facility show that over the course of a year, approximately 0.4% of the amount of I-131 that is used in the facility is presented to the air handling system.

For practical purposes in our calculations, the theoretical efficiency has been assumed to be 99%. On this basis, the total radioiodine transmitted to the atmosphere should not exceed .004% of the radioiodine handled, or less than 50 microcuries per Curie of radioiodine used in the facility.

The combination of particulate and gaseous filters described serves to reduce the effluent of other radionuclides such as Se-75, Mo-99, etc. to the lowest practicable level.

Confinement Systems (Liquid)

Liquids with low-level radioactivity; e.g., glassware washing water and water from hand sinks in materials handling areas, are collected in holdup tanks. There are four separate tanks, each having a capacity of 3.8 x 10 EO4 liters. Current liquid generation rates permit approximately a three-month decay of the holdup tank effluent. Tanks are sampled as necessary and released to the sanitary drain, if contents satisfy the concentration limits for such release. The remainder of the liquid wastes (approximately 1.0 x 10 EC6 liter/day) from the site is sanitary waste and is released without treatment or monitoring.

Alarm Systems

The manufacturing areas in building 124 are equipped with remote monitoring detectors. These are calibrated quarterly to produce a blue warning light and an audible alarm in the work area and in health physics operations area should background radiation levels reach 50 mr/hr. If the level of radiation is measured at 100 mr/hr or greater, a red light and alarm will be activated on the health physics control panel.

2.1.3.3 Access and Egress of Operating Personnel and Emergency Response Teams

2.1.3.3.1 Onsite

The radiopharmaceutical operations are conducted on the ground floor of the plant making access and egress for the evacuation of personnel an easy task. There are no elevators and the only stairways are those located in the unrestricted office areas and those leading to the second floor machine room.

In addition to the exits used routinely, the plant is also equipped with alarmed emergency exits.

The access control system has been designed to prohibit inadvertent or unauthorized access to high radiation areas and to provide personnel with the knowledge of the presence of radiation or radioactive materials. The access control system eliminates unnecessary exposure and assures exposures are maintained within regulatory limits.

One of the first indications to personnel of a potential hazard is the presence of caution signs at the entrance to radiation areas and labels on the containers of radioactive materials.

2.1.3.3.2 Near Site

Access and egress including the offsite evacuation of personnel as well as for onsite response by offsite based emergency response participants have been established at two site locations; 1) the Ward Street, and 2) the US #1 entrances.

2.1.3.4 Fire and Explosion Resistance and Suppression

All buildings within the site are provided with portable fire extinguishers distributed and maintained in accordance with NFPA 10, as required under the provisions of the OSHA 1910 subpart L and NJAC 5:18.

The plant is provided with Class II interior 1 1/2" hose lines installed in accordance with NFPA 14 and maintained as specified under subpart L of OSHA 1910 and NJAC:18.

Every work area where radioactive materials are stored, processed or tested is equipped with automatic sprinklers. It is expected that the hot cells which are constructed of steel, concrete and lead, equivalent to 4 to 8 inches of lead will serve as primary containment following an explosion. The building and the building's charcoal filtration systems are considered secondary containments.

It should be noted, however, that it is highly improbable that an explosion of any magnitude could occur since no explosive or combustible compounds or reagents are used in the hot cells during the manufacture of I-131 Therapeutic Oral Solutions or 99Mo-99mTc generators.

The building and processes within the site are protected by a looped and gridded fire protection water distributory system, fed by independent pumped water sources. Two automatic 1500 gallon pumps supplied by a 300,000 gallon above ground tank located on the south section of the site and 1500 G.M.P. pump taking suction from a 16" city waste main, supplies the site.

(Bldg. 123) provide water supply for building sprinkler systems and yard hydrants at a design pressure of 90 psi. All fire protection systems are maintained, tested and inspected in conformance with Factory Mutual Engineering requirements for secure properties, and the applicable provisions of subpart L of OSHA 1910 and NJAC 5:18-1.

Portable water is received on site through a 16" pipe from the New Brunswick water supply system and distributed via a looped and gridded system throughout the plant. The city water system in addition to domestic water supply, provides fire protection makeup water, and feeds a system of low pressure (40 psi) yard hydrants.

2.1.3.5 Shielding

The leaded glove boxes and hoods are used to manufacture and fill radiopharmaceuticals of different radioconcentrations. The shielding used varies from one to two inches of lead depending on the radionuclide and activity. The lead is encased in stainless steel which is expected to maintain its effectiveness under the most severe postulated accident conditions. In many cases, additional shielding is provided in the glove boxes and fume hoods to shield the bulk radioactive material as required to maintain radiation levels on the outside of the enclosure as low as practicable.

The hot cells are constructed of steel and concrete equivalent to four inches of lead for 131 I iodine and eight inches of lead for the 99Mo Molybdenum operations.

The steel and concrete used in the walls, flooring and ceiling of the hot cell's range from 14 inches to more than three feet in thickness.

It is very unlikely that a fire or explosion would occur within these hot cells. Therefore, it is highly improbably that an accident would occur which would reduce the effectiveness of the shielding.

2.1.4 Control Operations

Plant engineered systems are monitored routinely by plant engineers and the Health Physics group to ensure proper performance.

2.2 Demonstration of Engineered Provisions for Abnormal Operation

2.2.1 Process Systems

The manufacturing areas are served by a nonrecirculating air conditioned supply system utilizing all outside air introduced through a prefilter and a high efficiency particulate filter. A general system exhausts the various spaces through filtration equal to that of the supply system. Fume hoods, wherein particulate matter is the expected contaminant, are exhausted through an F-85 and a HEPA filter followed by a 1" high efficiency carbon filter to arrest any possible gaseous contaminant. The 99Mo-99mTc cave is exhausted through an F-85 and a HEPA filter and three 1" charcoal filters. Certain manufacturing glove boxes are also exhausted through an F-85, a HEPA and 3 one inch high efficiency carbon filters. Other manufacturing glove boxes where less volatile radionuclides are processed are exhausted through and F-85 and a HEPA filter followed by 2 one inch high efficiency carbon filters.

Each of the twelve fume hood system filter banks service from one to five fume hoods or other ancillary equipment. Each fume hood system has a manual air bypass to be used during filter changes.

Each glove box filter bank services up to five glove box units or similar equipment. Each glove box system has access to an auxiliary system offering identical filtration. There are no bypasses to allow passage of unfiltered exit air. There are eleven glove box systems and six auxiliary systems available for use during filter changes or maintenance.

Filtration for three hot cells is accomplished by employing two identical exhaust systems. One is in continuous operation, while the other exhaust system serves as an auxiliary system when the primary is shut down for decay prior to filter changes or maintenance. Each system is filtered by three Flanders roughing, three Flanders HEPA and nine one-inch equivalent MSA activated charcoal filters. There are no bypasses to allow passage of unfiltered cave system air. (See Addendum VII for schematic drawing showing the reltionships among the glove boxes, fume hoods, hot cells and filter banks.)

Each filter bank is equipped with before and after continuous sample tubes used to check charcoal filter efficiencies. They are changed on a weekly basis. The sample tubes are counted and an evaluation is made as to which bank should be changed, if applicable. There is no definite filter change criterion. Each system is examined individually to provide the most effective reduction in effluent.

The combination of particulate and gaseous filters described serves to reduce the effluent of other radionuclides such as 75Se, 99Mo, etc. to the lowest practicable level.

All exhaust systems are discharged to the effluent exhaust stack. The system used for sampling exit air from the stack is comprised of six one-inch lines within the exit duct. Each of these hold six pitot tubes facing upstream. The one-inch lines connect to two two-inch lines that pass through the main exhaust duct, then combine into a six-inch line. The system is drawn by a fan that exhausts to another exit duct prior to entry back to the main duct exhaust. The effluent air sample drawm from the six-inch line post fan, runs continuously at 10 liters per minute and is changed daily.

The radioactivity collected in the sampler is constantly measured by the stack alarm detector which will sound an alarm in Health Physics operations area should the maximum allowable activity for I-131 Iodine specified in Appendix B, Table II, Column I of 10CFR20 be exceeded. The sample cartridge is a 1/2" I.D. tube packed with a glass fiber filter, followed by 1" of activated charcoal and a sponge holder. The sampling system has been designed to assure isokinetic sampling in the main duct.

2.2.2 Alarm Systems and Release Prevention Capability

An "indicating and Alarm" panel in the Health Physics office provides the following:

Alarm and indicating lights for supply systems,

Running indication for all systems,

"Air failure" alarm and indication for all critical systems, and

Indicating lights showing status of critical filtration systems (i.e., lights will indicate which filter banks are in use and those that are on "standby.")

Air balance is maintained by means of constant volume regulators in each branch duct connection to glove boxes, fume hoods, etc.

2.2.3 Support Systems

Fire protection is provided at each branch connection to glove boxes and fume hoods, etc. by means of a spring-loaded fusible link fire damper. Carbon filters are monitored by means of ionization-type detectors in the duct work. Generally, detectors will isolate a filter fire from the air stream by

closing metal-seated shutoff valves and transfer the effluent to the standby filters, or stop the fan, depending on the type system involved.

The plant is also equipped with an auxiliary generator which will automatically engage in the event of an electrical power failure. The generator is capable of maintaining the air systems and emergency lighting for the plant.

Should the air system which supplies automatic controls fail, all filter intake and exhaust valves are designed to fail safe.

2.2.4 Control Operations

Verification that the filter bank systems are performing their intended functions at their maximum efficiencies is accomplished by continuously sampling air flow and collecting radioactivity. Each filter bank is equipped with samplers to analyze filter efficiencies. The samplers are checked on a weekly basis and assayed. Each of these filter banks are exhausted into a main duct which leaks to the breach of the Medotopes stack. The combined effluents are sampled in the breach before being discharged to the stack. The releases from the facility are sampled continuously and analyzed at least once each day, except over the weekend. The weekend sampler is run from Friday to Monday. The measured radioactivity is averaged over this period of time.

Air velocity measurements in ventilated enclosures are conducted at least quarterly to ensure regulatory requirements are satisfied.

In addition, plant engineers routinely monitor the plant's control systems located in the machine room area to ensure they are functioning properly.

3.0 CLASSES OF RADIOLOGICAL CONTINGENCIES

3.1 Classification System

The Squibb Radiological Contingency Plan is designed to handle emergency situations ranging from unusual events to general emergencies. These conditions have been categorized into four classes.

Class I

Unusual Event

Class I includes only those unusual events which indicate a potential degradation of the level of safety of the plant. The unusual event is confined to a specific area within the plant and would not require the evacuation of personnel from other areas of the plant unless further degradation of safety systems occur.

However, should an unusual event occur the Health Physics Department Head or his designee shall promptly inform State, Federal and/or local offsite authorities of the nature of the unusual event.

The appropriate offices to be contacted are:

U.S. Nuclear Regulatory Commission Regional Office - Normal work hours	215-337-5000
US Nuclear Regulatory Commission. Headquarter operations Center (after hours)	301-951-0550 301-427-4056 301-427-4259 301-492-8893
N. J. State Department of Environmental Protection	609-882-4200 609-292-5586 609-292-5587 609-292-5588
N. J. State Police	609-882-2000

Class II

Alert

Radioactive releases that are contained within the plant, but require evacuation of the plant because of the possibility of widespread contamination. This alert condition involves an actual or potential substantial degradation of the level of safety of the plant.

The State, Federal and/or local authorities must be informed of an alert condition and the reason for the alert as soon as it is discovered.

The following authorities must be notified immediately by the Health Physics Department Head or his designee:

U.S. Nuclear Regulatory Commission Regional Office - Normal work hours	215-337-5000
US Nuclear Regulatory Commission. Headquarter operations Center (after hours)	301-951-0550 301-427-4056 301-427-4259 301-492-8893
Regional Office - Normal work hours US Nuclear Regulatory Commission.	301-951-0550
Headquarter operations Center (after hours)	301-427-4056 301-427-4259 301-492-8893
N. J. State Department of Environmental Protection	609-882-4200 609-292-5586 609-292-5587 609-292-5588
N. J. State Police	609-882-2000

Class III

Site Emergency

Radioactive releases that are not contained within the plant and require evacuation of areas within the site. This site emergency involves actual or likely major failures of plant functions needed for protection of the public. Offsite releases are not expected to exceed EPA Protective Action Guidelines.

The State, Federal and/or local authorities must be informed of a site emergency condition and the reason for the site emergency as soon as it is discovered.

The following authorities must be notified immediately by the Health Physics Department Head or his designee:

U.S. Nuclear Regulatory Commission Regional Office - Normal work hours	215-337-5000
US Nuclear Regulatory Commission. Headquarter operations Center (after hours)	301-951-0550 301-427-4056 301-427-4259 301-492-8893
N. J. State Department of Environmental Protection	609-882-4200
	609-292-5586 609-292-5587 609-292-5588
N. J. State Police	609-882-2000

Class IV

General

Radioactive releases beyond the site boundary. This condition will be considered a General Emergency which involves actual or imminent loss of confinement integrity. Releases can be expected to exceed EPA Protective Action Guidelines.

The State, Federal and/or local authorities must be informed of a general emergency condition and the reason for the general emergency as soon as it is discovered.

The following authorities must be notified immediately by the Health Physics Department Head or his designee:

U.S. Nuclear Regulatory Commission Regional Office - Normal work hours	215-337-5000
US Nuclear Regulatory Commission. Headquarter operations Center (after hours)	301-951-0550 301-427-4056 301-427-4259 301-492-8893
N. J. State Department of Environmental Protection	609-882-4200 609-292-5586 609-292-5587 609-292-5588
N. J. State Police	609-882-2000

Consequences

Should 2.5 Curies of 131-I Iodine in liquid form accidently spill in the work area, the radiation levels, one meter from the source, would measure approximately 550 mr/hr. Radiation exposures to the workers and teams responding to this emergency can easily be maintained below the permissible limits.

Because the 131-I Iodine is in an aqueous (NaOH or Na2 SO4) form, volatilization will occur primarily by evaporation.

Since the work areas are under negative pressure, all airborne radioactivity will be confined to the area of the spill and should not enter adjacent areas. The fire in the pass thru of the hot cell will cause the dampers in the exhaust ducts to close. The airborne radioactivity created by the spill, will be exhausted through the room's air exhaust system (Separate from the hot cell exhaust.)

Let's assume that half of the 131-I Iodine (2.5 Curies) has vaporized over a period of one hour before the spill is contained and shielded. Although it is felt that a significant amount of radioactivity would plate out and condense in the duct before it reaches the filters, we will theorize that this does not occur, and the filters are challenged with the entire 1.2 curies of airborne 131-I Iodine.

Effective filtration will remove 99.9% of the radioactivity, releasing the remaining 0.1% (1.25 millicuries) to the stack.

Taking into consideration the fact that the exhaust velocity from the stack is 75,000 cfm, the air concentration from the stack for one hour would be 9.9 x 10-9 uCi/cc.

$$\frac{1.25 \times E{+}03 \text{ uCi}}{(2.8 \times E{+}04 \text{ cm3/ft3})\ (75{,}000 \text{ ft3/min})\ (60 \text{ min})}$$

Assuming that no additional radioactivity will be released to the stack, the average air concentration for a 24-hour period would be approximately 4.12 x 10-10 uCi/cc.

$$\frac{1.25 \times E{+}03 \text{ uCi}}{(2.8 \times E{+}04 \text{ cm3/ft3})\ (75{,}000 \text{ ft3/min})\ (60 \text{ min})\ (24 \text{ hours})}$$

Class III
SITE EMERGENCY

In this accident, it is postulated that an unlikely series of disasters has occurred which could result in the release of radioactive material beyond the plant.

In order to consider this type of accident, we must assume that the disaster involves the largest single shipment of radioiodine I-131 that exists in the radiopharmaceutical production facility at any one point in time. Therefore, it is presumed that the high level hot cell contains 45 curies of iodine I-131.

If we assume that the 45 curies of iodine I-131 is somehow ignited, the aqueous solution of sodium iodide I-131 would have to be evaporated to become airborne. It is also assumed, that the automatic dampers which close off the ventilation system for the hot cell fail and the fire is confined to the hot cell alone. The vaporized iodine I-131 would then seep along with the smoke from the fire, up into the ducts of the ventilation system. Fifty (50) percent of the 45 Curies is assumed to plate out before reaching the charcoal filters.

Since the smoke from the fire will not activate the pyrotronic smoke detectors and shut off the valves around the filters, the gas would therefore pass through the charcoal filters.

Of the 22.5 curies that remain, 0.1% of this amount, 22.5 millicures will leave the plant through the radiopharmaceutical buidling stack (exhaust filter efficiency 99.9%.)

Probability Considerations

The radioactive material I-131 is an aqueous solution of sodium iodide. This batch is housed within a glass flask and is contained in a "hot" cell made of concrete and steel. This hot cell does not contain any volatile solvents that are used in the processing of the materials.

The only possible source of combustion is a failure in the flourescent lights that are housed in glass shields approximately 8 feet above the iodine I-131 in the ceiling of the cell.

In order to create the circumstances postulated in the accident described above, we would require a fire in an area that contains no combustibles, a failure in the site electrical power supply and a failure in the radiopharmaceutical auxiliary electrical power supply. The probability of each event occurring simultaneously is highly unlikely.

Consequences

In order to calculate the radiological impact of a general emergency in a radiopharmaceutical area, it is assumed that 45 curies of iodine (I-131) released over a two-hour period through the stack with no filtration or decontamination.

The diffusion calibrations are based on the following:

I. Weather Stability Conditions:

Unstable	Pasquill	A B C
Neutral	Pasquill	D
Stable	Pasquill	E F G

for I - stack height 57.6 feet = 17.6 meters

$\bar{u}$ = 8.8 ft/sec (2.68 meters/sec)

II. Pasquill - Gifford Formula:

$$x = \frac{Q}{\pi \sigma y \sigma z \bar{u}} e^{-\frac{1}{2}(\frac{Y}{\sigma y})^2} \left\{ e^{-\frac{1}{2}(\frac{z-H}{\sigma z})^2} + e^{-\frac{1}{2}(\frac{z+H}{\sigma z})^2} \right\}$$

concentration along center line of plume:

$$x = \frac{Q}{\pi \sigma y \sigma z \bar{u}} e^{-\frac{1}{2}(\frac{H}{\sigma z})^2}$$

distances 100M, 200M, 300M, 500M, 1000M

$$Q = \frac{4.5 \text{ X } E{-}07 \text{ uCi}}{(2)\ (3.6 \text{ X } e{-}03)\text{sec}} = \frac{4.5 \text{ x } E{-}07 \text{ uCi}}{7.2 \text{ x } E{-}03 \text{ sec}} = 6.2 \text{ x } E{-}03 \text{ uCi/sec}$$

The calculated air concentrations for the various distances downwind of the release for the three weather conditions are as follows:

Stability B

Distance	$\pi\sigma_y\sigma_z\bar{u}$	$\frac{Q}{\pi\sigma_y\sigma_z\bar{u}}$	$e^{-\frac{1}{2}\left(\frac{H}{\sigma_z}\right)^2}$	$x[\mu Ci/M^3]$	$x[\mu Ci/cc]$
100M	2.59×10^{3}	2.39	.2836	.678	6.78×10^{-7}
200M	1.02×10^{6}	6.07×10^{-3}	.6976	4.23×10^{-3}	4.23×10^{-9}
300M	4.14×10^{6}	1.50×10^{-3}	.8437	1.26×10^{-3}	1.26×10^{-9}
500M	2.31×10^{7}	2.68×10^{-4}	.9418	2.52×10^{-4}	2.52×10^{-10}
1000M	3.22×10^{8}	1.92×10^{-5}	.9900	1.90×10^{-5}	1.90×10^{-11}

Stability D

Distance	$\pi\sigma_y\sigma_z\bar{u}$	$\frac{Q}{\pi\sigma_y\sigma_z\bar{u}}$	$e^{-\frac{1}{2}\left(\frac{H}{\sigma_z}\right)^2}$	$x[\mu Ci/M^3]$	$x[\mu Ci/cc]$
100M	3.10×10^{2}	20.000	.0007	.014	1.40×10^{-8}
200M	1.08×10^{3}	5.740	.1274	.731	7.31×10^{-7}
300M	2.22×10^{3}	2.790	.3499	.976	9.76×10^{-7}
500M	5.82×10^{3}	1.060	.6544	.693	6.93×10^{-7}
1000M	1.88×10^{4}	0.329	.8615	.283	2.83×10^{-7}

Stability F

Distance (M)	$\pi\sigma_y\sigma_z\bar{u}$	$\frac{Q}{\pi\sigma_y\sigma_z\bar{u}}$	$e^{-\frac{1}{2}\left(\frac{H}{\sigma_z}\right)^2}$	$x[\mu Ci/M^3]$	$x[\mu Ci/cc]$
100	58.0	106.9	6.9×10^{-15}	7.37×10^{-13}	7.37×10^{-19}
200	2.55×10^{2}	24.3	6.77×10^{-5}	1.64×10^{-3}	1.64×10^{-9}
300	5.18×10^{2}	12.0	7.77×10^{-3}	9.24×10^{-4}	9.24×10^{-10}
500	1.27×10^{3}	4.88	.1142	.5572	5.57×10^{-7}
1000	4.00×10^{3}	1.55	.4583	.710	7.10×10^{-7}

The plant fire brigade members respond to Bldg. 63 (fire house) and confirm the location of the alarm from the guard by direct phone from the gate house. The brigade responds with the engine and squad vehicle to the alarm location. The Zone Engineers on duty for the pump houses will report to and attend the sprinkler systems fire pumps. In event a building sprinkler head is discharging water on the fire, a fire pump will automatically start sending a signal to the guard house who notifies the fire brigade and the zone engineer. Water flow from sprinkler heads, initiates the building's local sprinkler water motor gong. The senior fire officer on duty will assume immediate command of all fire fighting activities. Should he decide that a site emergency exists, he immediately intitates the Emergency Management Plan.

The officer in charge will keep the management informed of all activities in the field. Where assistance is needed for fire fighting or during off-shift periods, the plant guard will alert the North Brunswick Fire Department. If additional help is needed beyond local Mutual Aid capacity, Middlesex County Fire Coordinator will be alerted by the North Brunswick Fire Department.

When a disaster exists, all Production Personnel will begin shut-down and evacuation procedures as directed by Plant Management. Areas remote from the disaster area may continue to discontinue operations as directed by Plant Management.

4.2.2.12 First Aid Squad

The Squibb First Aid Squad is a member of the New Jersey State First Aid Council and conforms to the 5 point statewide minimum training and proficiency standards. The squad manning of approximately 30 people covers all shifts and are alerted by paging radios initiated through the main security post, where all medical emergencies are reported by dedicated extension 3033.

Certain First Aid personnel are assigned to respond to all calls with the Squad's fully equipped ambulance. The site is divided into four zones with first aid personnel assigned within those zones responsing directly to the scene of medical emergencies within their zone. First aid kits and certain other equipment such as a containment stretcher for radiopharmaceutical use are located throughout the plant site. Squad members receive training monthly during regular two hour drill sessions.

4.2.2.13 Fire Brigade

The plant maintains an organized Fire Brigade currently consisting of 6 volunteers and 2 full-time fire protection people.

The five man engine assignment and two man squad complement respond to regular shift fire alarms which are transmitted by radio page, and air horn from the main security post where fire system alarm and dedicated fire reporting phone (ext. 3011) calls are received. The Fire Brigade members are equipped with personal protective equipment conforming to O.S.H.A. 1910 subpart L. They receive training at the N.J. State Fire College and during regular four house monthly training drills. During off-shift periods, the North Brunswick Volunteer Fire Dpartment are past due for site fire emergencies.

4.2.2.14 Radiation Emergency Plan-Security Department

A. Purpose

The purpose of this section is to provide guidance to plant security personnel concerning their responsibilities during a plant radiation emergency.

B. Scope

The Security Department shall endeavor to safeguard the health and safety of company employees/visitors and take all necessary action in accordance with instructions received from the Radiopharmaceutical Department Emergency Director of his designee.

C. Procedure

- Establish radio communications between the security office and the Plant Emergency Director's Control Room.
- Sound the necessary building evacuation alarms and direct employees to areas of safety.
- Alert the North Brunswick Police and Fire Departments and the New Brunswick Police Department to initiate their respective pre-arranged plans.
- Notify the Director of Engineering and Maintenance, the Personnel Manager and Industrial Hygiene and Safety Manager.
- Recall all available uniformed security personnel.
- Prohibit all vehicular and pedestrian egress and ingress to plant.

5.0 RADIOLOGICAL CONTINGENCY MEASURES

5.1 Activation of Radiological Contingency Response Organization

An unusual event exists upon the discovery of any condition which requires the implementation of controls to protect plant personnel or equipment and which creates a potential degradation of the level of safety of the plant.

An alert condition exists when:

A. Events are in process or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant. Any releases are expected to be limited to small fractions of the EPA Protection Action Guideline exposure levels. These events combined with the following conditions constitute an alert condition:

   1. Major injuries associated with severe radiocontamination to more than one individual (any injury requiring more than first aid.)

   2. Major radioactive contamination of more than one individual.

   3. The emergency encompases more than one work area or a group of rooms.

   4. Area radiation monitors indicate greater than 100 mr/hr background in more than one room.

B. Area fire detection monitors indicate a fire in any section of the air handling system.

A site emergency exists when:

A. Events are in process or have occurred which involve actual or likely major failures of plant functions needed for the protection of the public and/or any combination of the following:

   1. Major and multiple injuries to personnel which require offsite assistance.

   2. Evacuation of the radiopharmaceutical production building (#124) and areas around the restricted are is necessary.

3. Releases within the site boundary which cause dose rates in unrestricted areas to exceed 10 mr/hr but do not exceed EPA Protective Action Guideline exposure levels outside the site boundary.

B. A major fire in the radipharmaceutical production building (#124.)

A general emergency exists when:

A. Any condition which threatens to cause the release of radioactive material beyond the site boundary in quantites expected to exceed EPA Protection Action Guideline exposure levels offsite.

1. Events are in process or have occurred which involve actual imminent loss of confinement integrity.

2. A radiation dose rate of 10 mr/hr at the site boundary or concentration of radioactive material greather than MPC beyond the site boundary.

B. A major fire involving the release of large amounts of radioactive material.

5.2 Assessment Actions

5.2.1 Notification of Unusual Event

a. When an unusual event occurs, the following procedures should be implemented to alert response personnel and to notify management of the incident.

The individual(s) suspecting that an unusual event has occurred shall notify Health Physics personnel immediately, by telephone, plant intercom system and/or in person.

Intercom: 63 or 60

Telephone: 2168

Health Physics personnel shall immediately notify the Health Physics Department Head or his designee by intercom, telephone and/or in person.

Intercom: 14 or 60

Telephone: 2451 or 3158

	Office	Home
Daniel K. Balkunow	2451	(b)(6)
Edward Truskowski	3158	
Larry Gaines	3158	

The Health Physics Department Head shall notify:

		Extension
1.	Squibb Medical	3033
	Squibb Fire	3011
	Squibb Police	2111
	Middlesex General Hospital	828-3000, ext. 286 (if required)

2. Radiopharmaceutical Department Head

	Office	Home
G. Thompson or designee	3061	(b)(6)
J. Frankowski	3063	

3.	U.S. Nuclear Regulatory Commission Regional Office - Normal work hours	215-337-5000
	US Nuclear Regulatory Commission. Headquarter operations Center (after hours)	301-951-0550 301-427-4056 301-427-4259 301-492-8893
4.	N.J. State Department of Environmental Protection	609-292-5586,7,8
5.	N.J. State Police	609-882-2000

b. The emergency assistance team or alternate shall proceed to the immediate area of emergency with special monitoring equipment and determine the extent of the emergency.

c. The affected area shall be isolated with a barricade and warning signs shall be placed on all entrances leading to the emergency area.

d. All personnel not immediately involved with the emergency shall report to an area designated by the emergency team or alternate.

5.2.2 Alert

a. Persons discovering the emergency condition shall notify the Health Physics office by the most expeditious means available (Telephone 2168; Intercom 60 or 63.)

b. Health Physics personnel or shift supervisors sounds the appropriate alarm within the plant and notify the Health Physics Department Head of his designee:

Health Physics Department Head:	Office	Home
D. K. Balkunow or designee	2451	(b)(6)
E. Truskowski	3158	
L. Gaines	3158	

c. The Health Physics Department Head shall notify:

1. Medical Ext. 3033
2. Fire Ext. 3011
3. Police Ext. 2111
4. Middlesex General Hospital - 828-3000, ext. 286
5. New Brunswick Police - 201-745-5200
6. North Brunswick Police - 201-545-3200
7. Radiopharmaceutical Department Head or designee:

	Office	Home
G. Thompson or designee,	3061	(b)(6)
J. Frankowski	3068	

8. U.S. Nuclear Regulatory Commission 215-337-5000
Regional Office - Normal work hours

US Nuclear Regulatory Commission. 301-951-0550
Headquarter operations Center 301-427-4056
(after hours) 301-427-4259
301-492-8893

9. N.J. State Department of Environmental Protection
609-882-4200

609-292-5586,7,8

10. N.J. State Police 609-882-2000

d. The Radiopharmaceutical Department Head shall notify:

V. P. & General Mgr., Sq. Diagnostics

	Office	Home
M. Loberg	2203	(b)(6)

e. The Health Physics Department Head shall notify:

V. P. of World Wide Quality Control
and Quality Assurance

E. A. Gusmano	3191	(b)(6)

f. Persons in the immediate area of the emergency condition shall take appropriate action to limit the extent of the incident with available means to the extent possible, then retreat to a safe location and await assistance.

g. All shift personnel, not immediately involved with the incident, shall report to the area designated by the Health Physics or shift supervisors.

5.2.3 Site Area Emergency

a. Persons discovering the emergency condition shall immediately notify the Health Physics Office by the most expeditious means available.

b. Telephone ext. 2168
or
Intercom 60 or 63

c. Health Physics personnel or shift supervisors sound the appropriate alarm (horn) within the radiopharmaceutical production building and notify the Health Physics Department Head or his designee:

Health Physics Department Head:	Office	Home
D. K. Balkunow or designee,	2451	(b)(6)
E. Truskowski	3158	
L. Gaines	3158	

d. The Health Physics Department Head shall notify:

1. Medical Ext. 3033
2. Fire Ext. 3011
3. Police Ext. 2111
4. Middlesex General Hospital -828-3000, ext. 286
5. New Brunswick Police - 201-745-5200
6. North Brunswick Police - 201-545-3200
7. Radiopharmaceutical Department Head or designee:

	Office	Home
G. Thompson or designee,	3061	(b)(6)
J. Frankowski	3063	

8. U.S. Nuclear Regulatory Commission Regional Office - Normal work hours — 215-337-5000

   US Nuclear Regulatory Commission, Headquarter operations Center (after hours) — 301-951-0550, 301-427-4056, 301-427-4259, 301-492-8893

9. N.J. State Department of Environmental Protection- 609-882-4200
609-292-5586
609-292-5587
609-292-5588

10. N.J. State Police 609-882-2000

e. The Health Physics Department head shall notify:

	Office	Home
V. P. Gen. Mgr. Diagnostics		
M. Loberg	2203	(b)(6)

f. The Health Physics Department Head shall notify:

	Office	Home
V. P. of World Wide Quality Control and Quality Assurance		
E. A. Gusmano	3191	(b)(6)

g. Persons in the immediate area of the emergency condition shall take appropriate action to limit the extent of the incident with available means to the extent possible, then retreat to a safe location and await assistance.

h. Shift operating personnel, not immediately involved with the incident, report to the Health Physics Office.

5.2.4 General Emergency

a. Person(s) discovering the emergency condition shall immediately notify the Health Physics Office by the most expeditious means available (Tel. 2168: Intercom 63 or 60.)

b. Health Physics personnel or shift supervisors sound the appropriate alarm within the radiopharmaceutical production building and notify the Health Physics Department Head or his designee:

Health Physics Department Head:	Office	Home
D. K. Balkunow or designee,	2451	(b)(6)
E. Truskowski	3158	
L. Gaines	3158	

c. The Health Physics Department Head will notify:

1. Medical Ext. 3033
2. Fire Ext. 3011
3. Police Ext. 2111
4. Middlesex General Hospital - 828-3000, ext. 286
5. New Brunswick police - 201-745-5200
6. North Brunswick Police - 201-545-3200

7. Radiopharmaceutical Department Head or designee:

	Office	Home
G. Thompson or designee,	3061	(b)(6)
J. Frankowski	3063	

8. U.S. Nuclear Regulatory Commission Regional Office - Normal work hours — 215-337-5000

   US Nuclear Regulatory Commission. Headquarter operations Center (after hours) — 301-951-0550, 301-427-4056, 301-427-4259, 301-492-8893

9. N. J. State Department of Environmental Protection

   609-882-4200

   609-292-5586,7,8

10. N.J. State Police — 609-882-2000

d. The Radiopharmaceutical Department Head shall notify:

V.P.& Mgr.Squibb Diagnostics	Office	Home
M. Loberg	2203	(b)(6)

e. The Health Physics Department Head shall notify:

V. P. of World Wide Quality Control and Quality Assurance		
E. A. Gusmano	3191	(b)(6)

f. Persons in the immediate area of the emergency condition shall take appropriate action to limit the extent of the incident with available means, to the extent possible, then retreat to a safe location and await assistance.

5.3 Corrective Actions

5.3.1 Notification of Unusual Event

a. The Emergency Director shall designate personnel to proceed to the scene of the emergency with the necessary equipment to meet the emergency. These persons will evaluate the extent and magnitude of the emergency, determine if radiation hazards exist and report their findings to the Emergency Director.

b. The Emergency Director shall direct actions necessary to bring the emergency under control with the help of the emergency assistance team and/or the designated alternates.

c. Surveys and bioassays for personnel involved with the emergency will be instituted immediately.

5.3.2 Alert Condition

Plant Emergency Director

a. Proceed to and take charge of the Emergency Coordination Center.

b. Determine if the assembly point is in a safe area through the use of portable survey instruments.

c. Evaluate the emergency as quickly as possible, and determine if the incident is causing a release of activity outside the plant which could result in a site emergency.

d. Dispatch monitoring team to the scene of the emergency with the emergency kit to evaluate the extent and magnitude of the emergency and survey the area along the boundary.

e. Direct Radiopharmaceutical Production Supervisors to a check of time card rack and visitors' log book to determine what personnel other than the emergency team personnel have not left the plant.

f. Notify the following members of management:

- Radiopharmaceutical Manufacturing Department Head
- Squibb Plant Manager
- Diagnostics Quality Control Department Head

- Plant Security Head
- Plant Medical Department Head
- Other personnel as required

g. Set up necessary auxiliary communications (walkie-talkie), if necessary.

h. Establish barricades with Plant Security force at the plant boundary to restrict areas to the plant.

i. If there are injured personnel, notify the senior medical representative.

j. Provide a Health Physics representative to accompany the patient to the hospital with the ambulance emergency kit, to maintain radiological controls in the hospital.

k. Supervise collection of emergency data in the Emergency monitoring log.

5.3.3 Site Emergency

Plant Emergency Director

a. Proceed to and take charge of the Emergency Coordination Center.

b. Determine if the assembly point is in a safe area through the use of portable survey instruments. If this assembly point is not safe (greater than 100 mr/hr), direct personnel to the Squibb parking lot.

c. Evaluate the emergency and, as quickly as possible, determine if the incident is causing a release of activity offsite and could result in a general emergency.

d. Dispatch monitoring team to the scene of the emergency with the emergency kit, to evaluate the extent and magnitude of the emergency and survey the area along the site boundary. If levels exceed 10 mr/hr or MPC, declare a general emergency.

e. Direct Radiopharmaceutical Production Supervisors to make a check of time card rack and visitors' log book to determine what personnel other than the emergency team personnel have not left the plant.

f. Notify the following members of management:

- Radiopharmaceutical Manufacturing Department Head
- Squibb Plant Manager
- Diagnostics Quality Control Department Head
- Plant Security Head
- Plant Medical Department Head
- Other personnel as required

g. Set up necessary auxiliary communications (walkie-talkie), if necessary.

h. Establish barricades with Plant Security force at the site boundary gate houses to restrict access to the site.

i. Evaluate the emergency and, as quickly as possible, determine the release of radioactivity. Refer to Addendum V for methodology and parameters used in calculating atmospheric dispersion and dose rates to individuals.

j. If there are injured personnel, notify the senior Medical Representative.

k. Provide a Health Physics representative to accompany the patient to the hospital with the ambulance emergency kit, to maintain radiological controls in the hospital.

l. Supervise collection of emergency data in the Contingency Monitoring Log.

m. Notify Plant Security to institute site industrial emergency and disaster control plan, if necessary.

5.3.4 General Emergency

a. Note the wind direction, instruct security to evacuate onsite personnel, if necessary, through the upwind exits of the site and sound the evacuation alarms.

b. Notify the following members of Squibb Management:

- General Manager Diagnostics Division
- Diagnostics Quality Control Department Head

- Radiopharmaceutical Quality Control Department Head
- Plant Security Head
- Plant Medical Department Head
- Other personnel as required

c. Determine if the Emergency Coordination Center is in a safe condition through the use of portable survey instruments.

d. Proceed to take charge of the Emergency Coordination Center.

e. Dispatch a monitoring team to scene of the emergency to evaluate the extent and magnitude of the emergency.

f. Evaluate the emergency and, as quickly as possible, using meteorological data, overlay and area maps, determine the extent of the offsite release of radioactivity. See Addendum V for methodology and parameters used in calculating atmospheric dispersion and dose rates to individuals.

g. If there are any injured personnel, assign the Senior Medical Representative to administer first aid and prepare the patient(s) for transfer to the hospital.

h. Provide a health physics representative to accompany the patient(s) to the hospital with the ambulance emergency kit, to maintain radiological control in the hospital.

i. Evaluate monitoring data from survey teams as it becomes available.

j. Provide monitoring team for State Department of Environmental Protection.

k. Inform company management, State Department of Environmental Protection and Nuclear Regulatory Commission of offsite radiological conditions.

5.4 Protective Actions

Unusual Event

a. If an unusual event should occur, an individual's first responsibility is his own safety. All persons shall evacuate the emergency area immediately, holding their breath, if possible.

E. R. SQUIBB & SONS, INC.

EMERGENCY CALL LIST

Title	Squibb Extension
V.P. and General Manager Dianostics Division	2203
Dir. Engineering & Maintenance	3045
Radiopharmaceutical Mfg Dept Head	3061
VP World Wide Quality Control and Quality Assurance	3191
Health Physics Department Head	2451
Health Physics Supervisor	3158
Health Physics General Supervisor	2168
Plant Security Head	2101
Director Personnel & Ind Rel	3034
Director Employee Health	2486
Manager Ind Hygiene and Safety	2885
Diagnostic Quality Control Department Head	2361

NOTE: An updated emergency list of home addresses and telephone #'s are maintained by Security and Health Physics.

U.S. Nuclear Regulatory Commission Regional Office - Normal work hours	215-337-5000
US Nuclear Regulatory Commission. Headquarter operations Center (after hours)	301-951-0550 301-427-4056 301-427-4259 301-492-8893

NJ State Dept. of Environmental Protection	(609) 882-4200 (609) 292-5586 (609) 292-5587 (609) 292-5588
NJ State Police	(609) 882-2000

g. Place patient and ambulance emergency kit in the vehicle and transport to hospital.

h. A representative from Health Physics will accompany the victim(s) to the hospital to maintain radiological control.

Medical Department

A. Director of Employee Health

This individual is responsible for all medical problems associated with a plant disaster, assisted by other members of the Medical Dept. and working in cooperation with members of the First Aid Squad and the Manager of the Industrial Hygiene and Safety Dept. His responsibilities include:

1. Providing adequate facilities and supplies for first aid treatment of injured employees.

2. Providing adequate means for transportation of casualties from the disaster area.

3. Establishing liaison with area hospitals.

B. Medical Supplies

These are stored in the emergency locker in Bldg. 124 and consist of air packs, towels and sheets, dosimeters for medical and first aid personnel and a fully equipped first aid kit. There is an emergency carrier in which severely injured patients can be decontaminated. Decontamination of less severely injured patients can be carried out in showers near the work site. The First Aid Ambulance is equipped with additional supplies including splints and oxygen.

C. Procedure

When the emergency call is received in the Medical Dept. on the day shift, a doctor and nurse will go to the First Aid Area in Bldg. 124. Simultaneously the guard in the Building 31 Gate House is notified and will dispatch the ambulance and members of the squad on duty. The decisions as to appropriate treatment and disposition will be made by the doctor.

On the second and third shifts when no doctor is present in the plant, the First Aid Squad members will report to the First Aid Area in Bldg. 124 and make the decision as to appropriate disposition. The nurse in the Medical Department is to be notified as to the number of patients and nature of injuries and will call the designated hospital with this information. If no nurse is on duty the First Aid Squad will call.

If the number of patients requires it the guard will call the North Brunswick Squad and other back-up squads as needed.

If not in the plant the Medical Director or his assistant is to be called.

D. The nurse on duty from 3:00 p.m. to 11:00 p.m. will follow the instructions outlined above.

E. From 11:00 p.m. Friday, until 7:00 a.m. Monday, or anytime when there isn't a nurse or doctor on duty, the guards and first aid groups will follow first aid instructions and assit in getting the ill or injured person to a hospital or doctor.

6.5 Emergency Monitoring Equipment

The following is a list of emergency equipment that will be available for personnel and area monitoring as well as that for assessing the release of radioactive materials into the environment:

6.5.1. Model 22A Portable Scaler Rate Meter with Single Channel Analyzer

This equipment is to be used for immediate assessments of radioactive samples. It is portable and therefore convenient and practical for inplant and out of plant operations.

6.5.2 Eberline "Teletector Survey Monitor"

This equipment is to be used for assessing radiation and high radiation areas. Its detector can be extended approximately ten feet to allow emergency personnel to obtain accurate measurements while minimizing radiation exposures to themselves.

6.5.3 G.M. Portable Survey Meter

contamination equipment monitoring operating personnel low level external

6.5.4 Two (2) Victoreen and/or Eberline Survey Monitors

These equipment will be used for radiation survey measurements during a radiological emergency.

6.5.5 Packard Auto-Gamma Spectrometer

This equipment will be used for accurate analysis of air,

The plant maintains an organized Fire Brigade consisting of volunteers and 2 full-time fire fighters (see supplement B of this section).

A five man engine assignment and two man squad complement respond to all fire alarms which are transmitted by radio page and air horn from the main security post where fire system alarm and dedicated fire reporting phone (ext. 3011) calls are received. The Fire Brigade members are equipped with personal protective equipment conforming to O.S.H.A. 1910 subpart L. They receive training at the N.J. State Fire College and during regular four hour monthly training drills.

The Fire Chief is responsible for the training of fire fighting personnel, the purchase and maintenance of fire fighting equipment in the plant and pre-plan of emergencies which might occur at the facility.

His responsibilities include:

1. A complete knowledge of the over-all plant layout, including construction, location of personnel hazardous areas, location of entrances and exits, and plant conditions requiring special fire fighting techniques.
2. The organization and training of the fire brigade.
3. The maintenance of fire fighting equipment.
4. The direction of all fire fighting activities.
5. An over-all knowledge of primary and secondary fire protection water systems in and immediately adjacent to the plant.
6. Liason with municipal, county and state fire fighting organizations.
7. A knowledge of the duties of the other elements which make up the Disaster Organization to permit the maximum coordination in an emergency.

An annual training drill is held with all onsite emergency teams.

7.3 Tests and Drills

7.3.1 Emergency Training Exercise

NRC Form 374A (11-83) U.S. NUCLEAR REGULATORY COMMISSION

MATERIALS LICENSE
SUPPLEMENTARY SHEET

PAGE 1 OF 1 PAGES

License number
29-00139-02

Docket or Reference number
030-05222

Amendment No. 67

E. R. Squibb and Sons, Inc.
Squibb Institute for Medical Research
Georges Road
New Brunswick, New Jersey 08903

In accordance with letter dated December 4, 1985, License Number 29-00139-02 is amended as follows:

Condition 23. is amended to read:

23. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in letters dated June 29, 1981, December 4, 1981, March 17, 1982, June 22, 1982, and December 15, 1982; application dated May 17, 1983; letters dated May 27, 1983, June 6, 1983, July 11, 1983, October 17, 1983, December 14, 1983, February 17, 1984, September 10, 1984, and February 7, 1985; letter with enclosures dated April 3, 1985; letter dated July 5, 1985; two letters dated August 5, 1985; and letters dated August 6, 1985 and December 4, 1985. The Nuclear Regulatory Commission's regulations shall govern the licensee's statements in applications or letters, unless the statements are more restrictive than the regulations.

For the U.S. Nuclear Regulatory Commission

By John E. Glenn
Nuclear Materials Safety and
Safeguards Branch, Region I
King of Prussia, Pennsylvania 19406

Date DEC 26 1985

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3 pp.

ADDENDUM IV

North Brunswick Police Department

GEORGE J. LEPRE
Director

GEORGE T. MAGYAR
Deputy Chief

February 21, 1986

Mr. Harold G. Seidler
Security Manager
E.R. Squibb & Sons Inc.
Georges Road
New Brunswick, New Jersey

Dear Mr. Seidler:

In response to your letter of January 28, 1986, relating to our function in the event of a radiological emergency at your facility, be advised that the procedure initiated June, 1981 is still in effect, a copy of which is attached.

If you should have any further questions regarding this matter, please contact me.

Very truly yours,

George Lepre

GEORGE J. LEPRE
Director of Police

GJL/ap

105308

711 HERMANN ROAD • P.O. BOX 182 • NORTH BRUNSWICK, NEW JERSEY 08902 • 201-545-4300

Docket No. 030-05222

TO: C. James Holloway, License Fee Management Staff, ADM

SUBJECT: MATERIALS LICENSE AMENDMENT CLASSIFICATION

APPLICANT: E. R Squibb

License No: 29-00139-02 Fee Category: 3A

Application Dated: 4/1/86 Received: 4/4/86 (LFMS)

1. The above application for amendment has been reviewed by NMSS/REGIONAL OFFICE in accordance with §170.31 of Part 170, and will require an amendment to the license. _____

2. The application is not subject to fees because it was filed

(a) _____ pursuant to written NRC request and the amendment is being issued for the convenience of the Commission,

or (b) _____ Other (State reason) X

Does not decrease effectiveness of plan

Signature Jeanne M Johnson

Date June 23, 1986