

BEFORE THE UNITED STATES
NUCLEAR REGULATORY COMMISSION

In the Matter of)
POWER AUTHORITY OF THE STATE OF NEW YORK) Docket No. 50-286
Indian Point 3 Nuclear Power Plant)

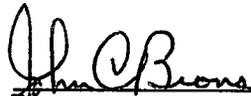
APPLICATION FOR AMENDMENT TO OPERATING LICENSE

Pursuant to Section 50.90 of the regulations of the Nuclear Regulatory Commission (NRC), the Power Authority of the State of New York, as holder of Facility Operating License No. DPR-64, hereby applies for an Amendment to this Operating License.

The proposed amendment changes the expiration date of the Indian Point 3 (IP3) Operating License as stated in Section 3 of the Amended Facility Operating License from August 13, 2009 to December 12, 2015. This new expiration date corresponds to forty (40) years from the date of issuance of the Operating License as permitted under 10CFR50.51. IP3 was designed and constructed for an operating lifetime of 40 years. Under the current expiration date of August 13, 2009 IP3 would have an operating lifetime of slightly less than 34 years.

The proposed change to the Operating License is Attachment I to this application. The Safety Evaluation is included in Attachment II.

POWER AUTHORITY OF THE
STATE OF NEW YORK


By _____
John C. Brons
Executive Vice President
Nuclear Generation

STATE OF NEW YORK
COUNTY OF WESTCHESTER

Subscribed and Sworn to before me
this 11th day of June 1990


Notary Public

MINA HOLDEN
NOTARY PUBLIC, State of New York
Westchester County
No. 4829150
My Commission Expires Aug. 31, 1991

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ATTACHMENT I TO IPN-90-029

PROPOSED CHANGE TO THE OPERATING LICENSE
EXPIRATION DATE

NEW YORK POWER AUTHORITY
INDIAN POINT 3 NUCLEAR POWER PLANT
DOCKET NO. 50-286
DPR-64

Section 3 of the Amended Facility Operating License is proposed to read as follows:

3. This amended license is effective at 12:01 a.m. March 10, 1978 and shall expire at midnight, December 12, 2015.

ATTACHMENT II TO IPN-90-029

SAFETY EVALUATION FOR THE PROPOSED CHANGE
TO THE OPERATING LICENSE EXPIRATION DATE

NEW YORK POWER AUTHORITY
INDIAN POINT 3 NUCLEAR POWER PLANT
DOCKET NO. 50-286

Section I - Description of Changes

This proposed change revises the expiration date of the Indian Point 3 (IP3) Operating License to account for forty (40) years of operation from the date of issuance of the Operating License (December 12, 1975). Specifically, Section 3 of the Amended Facility Operating License is changed from:

“... and shall expire at midnight, August 13, 2009.”

to read:

“... and shall expire at midnight, December 12, 2015.”

Section II - Evaluation of Changes

Prior to 1982, the Commission granted operating licenses to nuclear power reactors with the date of expiration linked to the issuance date of the construction permits. This practice was modified in response to a request by Commonwealth Edison Company for the Commission to issue an operating license (OL) for La Salle Units 1 and 2, for a full term of 40 years beginning with the date of issuance of the OL. This request was approved, and La Salle Unit 1 received an OL for 40 years from the date of OL issuance in 1982. In an August 16, 1982 memorandum to the Commission, Mr. William I. Dircks, Executive Director for Operations, elaborated on the new OL position and directed the staff to issue an OL for the term requested by the applicant, but in no case to exceed 40 years from date of issuance of the OL.

The Commission's practice of granting 40 year OLs has also, upon request by the licensee, been extended to plants licensed before 1982. Baltimore Gas and Electric Company requested a license amendment to change the OL expiration dates of Calvert Cliffs Units 1 and 2 to account for 40 years of operation from the date of issuance of the OL. The Commission granted this request and issued these amendments on May 1, 1985. The Commission, in amending the Calvert Cliffs licenses, noted that the issuance of OLs for 40 years from the date of the construction permit issuance rather than 40 years from the date of the OL issuance was arbitrary, and had no safety basis. Similarly, the Commission has approved revision of the OL expiration date for a number of plants licensed prior to 1982, including the Indian Point 2 and James A. FitzPatrick plants.

IP3 is currently licensed for plant operation for 40 years from the date of issuance of the construction permit. Accounting for the time that was required for construction, this represents an effective OL term of slightly less than 34 years.

IP3 was designed, licensed and constructed for 40 years of operation as discussed in various places in the Final Safety Analysis Report (FSAR). This 40 year design life presumed operation at a thermal power level of 3025 MW with a cumulative lifetime capacity factor of 80%, or 32 effective full power years (EFPY). To date, IP3 has attained a cumulative capacity factor of approximately 52%. Based on IP3's operating projections, the Authority has determined that for the next few cycles a capacity factor of 75% is more realistic for IP3.

The reactor vessel was initially designed and licensed based on an assumed 40 year service life with an 80% capacity factor. A comprehensive vessel material surveillance program is maintained in accordance with 10CFR50, Appendix H. Three (3) capsule specimens (Capsules T, Y and Z) have been removed and analyzed to date. The Authority has completed an update of

RT_{PTS} values in accordance with the Pressurized Thermal Shock (PTS) Rule 10CFR50.61 based on the most recent capsule removed (Capsule Z). The Authority's submittal of September 28, 1989 provided the results of this analysis in WCAP-11045, Revision 1, "Indian Point Unit 3 Reactor Vessel Fluence And RT_{PTS} Evaluations." The results show that based on a capacity factor of 75% from Cycle 7 on, the projected RT_{PTS} value for the limiting reactor vessel beltline material at the end of the current OL (August 13, 2009) is 264°F. This value is 6°F less than the NRC screening criterion of 270°F for the beltline material. Projections to 40 years from issuance of the OL (December 12, 2015) for the limiting reactor vessel beltline material indicate a projected RT_{PTS} value of 270°F assuming the same 75% capacity factor. Hence, the NRC screening criteria is not exceeded as a result of revising the OL expiration date. In accordance with 10CFR50.61 the Authority will update the RT_{PTS} values whenever changes in core loadings, surveillance measurements, or other information indicates a significant change in the projected values. Periodic reactor vessel inservice inspection and testing requirements provide further assurance that any degradation will be identified in a timely manner.

The 40 year service life design does not imply that some equipment and components will not require replacement during the plant lifetime. The General Design Criteria established the necessary design, fabrication, construction, testing and performance requirements for structures, systems and components important to safety. Design features have been incorporated and inservice inspection programs are in place, to facilitate the inspection and testing of systems and equipment, ensuring continuous operating integrity. Any degradation in plant equipment is identified and corrected based on the surveillance and maintenance programs, which are implemented in accordance with ASME codes and the plant Technical Specifications. In addition, it should be noted that improvements in existing maintenance and surveillance programs, as well as the development of new programs are constantly underway at IP3. Such programs will ensure the operating integrity of the plant for the entire OL.

With regard to equipment lifetime, it is noted that some components will be expected to require replacement during the life of the plant. Such replacements are more or less typical for all power plants and are part of plant maintenance activities. As such, they are unaffected by the requested change to the IP3 OL expiration date. To date some of the major component replacements at IP3 have included the steam generators, the main condensers, feedwater heaters, and the service water pumps. These upgrades were performed to increase the efficiency and reliability of plant systems, and ultimately to increase the useful life of IP3.

Environmental qualification (EQ) aging analyses of plant safety related electrical equipment, in accordance with 10CFR50.49, has identified qualified lifetimes for this equipment. These lifetimes have been incorporated into the IP3 maintenance and surveillance procedures to ensure that safety related electrical equipment remains qualified and available to perform its safety function regardless of the overall age of the plant.

The effect that the proposed change would have on the environment and the general public must be evaluated. With regard to non-radiological discharges the State Pollutant Discharge Elimination System (SPDES) permit was issued August 28, 1987 and will not expire until October 1, 1992. The Authority expects subsequent SPDES permits will be issued every five (5) years upon expiration in 1992. There will be no significant non-radiological impact on the environment with regard to airborne, liquid or solid discharges from IP3 as a result of changing the OL expiration date since the Authority will abide by the SPDES permits. In fact, continued operation of IP3 will avert non-radiological environmental effects of effluents from non-nuclear plants that would be required to operate in order to replace the power supplied by IP3.

Release of radioactive liquids and gases have historically been lower for IP3 than those estimated in the Environmental Report (ER) and the Final Environmental Statement (FES) and are expected to remain so. Table 1 is a summary of the most recent IP3 offsite dose assessments, covering the period January 1 through December 31, 1989. No specific land use changes which would affect offsite dose calculations have occurred. These doses are typical and demonstrate that releases at IP3 are well below the FES estimates and the 10CFR50 Appendix I limits. As such, no significant impact of these releases is expected in connection with the proposed change.

The curie content of radioactive solid waste shipped from IP3 historically has been less than projected in the ER and the FES. In addition to waste shipped offsite, IP3 is currently storing 432 spent fuel assemblies in the Spent Fuel Pool (SFP) as a result of operation through Cycle 6 (February 1989). The SFP has a capacity for 840 assemblies, and the NRC has approved an amendment to the IP3 Technical Specifications (Amendment No. 90) which allows for the expansion of the SFP storage capacity to 1345 assemblies. This modification will be completed by mid-1990.

The fuel cycles for IP3 have ranged in length from 328.1 Effective Full Power Days (EFPD's) for Cycle 2, to 504.9 EFPD's for Cycle 1. Generally, cycle length has been increasing since Cycle 2. It is the Authority's objective to go to cycle lengths of 24 months with 550 to 575 EFPD's beginning with Cycle 9 (March 1994). It should be noted that to date, the maximum burnup of any single fuel assembly is 46,032 MWD/MTU, on an assembly that was discharged at the end of Cycle 6.

IP3 is currently in its seventh fuel cycle. The energy demands for this cycle and the six cycles before it have varied widely, and the fuel design specifications have been set to meet these demands. Fuel enrichment has ranged from a minimum of 2.25 weight percent U-235 (Cycle 1) to 3.803 weight percent U-235 (Cycle 7). At present, IP3 is licensed to store fuel with enrichments up to 4.5 weight percent U-235.

The total projected number of fuel cycles before the current OL expiration date (August 13, 2009) is seventeen (17). Revising the OL expiration date to December 12, 2015 will increase the number of fuel cycles by approximately three (3) to a total of twenty (20), based on a 24 month cycle. The spent fuel discharged per cycle along with the projected discharges out to 2015 is provided in Table 2. The total number of discharged fuel assemblies including a full core discharge at the end of IP3's current expiration date (August 13, 2009) is 1454. The projected total number of spent fuel assemblies including a full core discharge for the expiration date of December 12, 2015 is 1706.

The SFP expansion will accommodate anticipated discharged fuel until the end of Cycle 14, scheduled for March 2004. At that time, the total number of spent fuel assemblies plus a full core discharge is projected to be 1286. The SFP expansion will allow for the storage of 1345 assemblies, therefore 59 spaces would still be available. It is also expected that at that time, the U. S. Department of Energy (DOE) will begin removing spent fuel from nuclear facilities. However, if this does not occur, operating to the end of the current OL expiration date of August 13, 2009, will result in the discharge of an additional 168 assemblies beyond Cycle 14. Therefore, an additional method of storage will be required to accommodate 109 assemblies. Changing the OL expiration date to December 12, 2015, will increase the total number of spent fuel assemblies requiring an alternate method of storage to about 361.

The Authority is investigating alternative technologies such as fuel rod consolidation and dry storage. Since these technologies are feasible and licensable, there is a reasonable basis for expecting that IP3's spent fuel storage requirements will be accommodated.

The historical occupational exposure at IP3 has been approximately 450 man-rem per year, which is about the number projected in the FES. As a result of recent plant improvements, and the Authority's ALARA program, future exposures are expected to be substantially lower. The projected collective occupational exposure for IP3 for the period of 2009 to 2015 is expected to average 225 man-rem per year assuming refueling outages every two (2) years (3 for the period). The projected exposures are based on expected reductions in radiation dose rates from ongoing ALARA efforts to reduce source terms which include the use of low cobalt material, and improved shielding and decontamination. In addition, the ALARA program at IP3 includes reviews of plant modifications, procedures and maintenance activities in order to provide necessary precautions and input to ensure that all work is performed in such a way as to minimize radiation exposure to all personnel.

The consequences of design basis accidents are determined in terms of the resulting exposure to the general public. A comparison of the population projections in the FSAR for the ten (10) mile Emergency Planning Zone (EPZ) was made to that reported in the evacuation time estimate studies that are performed every five (5) years in compliance with FEMA requirements. The 1987 reported population was 17% below the FSAR projections for 1980. If this trend continues as expected, the population for the period of 2009 through 2015 should be lower than originally projected. Therefore, cumulative exposure to the general public, due to a design basis accident would be less than originally projected because of the lower than projected population in the surrounding area.

IP3 is a reliable and economical source of electricity in New York State. The Authority has determined the generation benefit of revising IP3's OL expiration date from August 13, 2009 to December 12, 2015. The total net benefit for this period is estimated to be approximately \$6.7 billion in current dollars or \$1.1 billion in constant 1989 dollars. Based on this analysis and the Authority's maintenance and surveillance practices, the Authority fully expects IP3 to remain reliable and economically competitive, beyond the current OL expiration date of August 13, 2009 and to at least December 12, 2015.

Section III - No Significant Hazards Evaluation

Consistent with the requirements of 10 CFR 50.92, the enclosed application is judged to involve no significant hazards based on the following information:

- (1) Does the proposed license amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response:

The proposed change does not involve any changes to the design or operation of IP3 which may affect the probability or consequences of an accident evaluated in the FSAR. IP3 was designed and constructed on the basis of a forty (40) year life. The accidents analyzed in the FSAR were postulated on the basis of a 40 year life. No changes will be made that could alter postulated scenarios regarding accident initiation and/or response. Existing surveillance, inspection, testing and maintenance practices and procedures ensure that degradation in plant equipment, structures and components will be identified and corrected throughout the life of the plant. The effect of aging of electrical equipment, in accordance with 10CFR50.49 has been incorporated into the plant maintenance and surveillance procedures. Therefore, the probability or consequences of a postulated accident previously evaluated in the FSAR are not increased as a result of the proposed change.

- (2) Does the proposed license amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response:

The proposed change does not involve any changes to the physical structures, components or systems of IP3. Existing surveillance, inspection, testing and maintenance practices and procedures will assure full operability for the plant's design lifetime of 40 years. Continued operation of IP3 in accordance with these approved procedures and practices will not create a new or different kind of accident.

- (3) Does the proposed amendment involve a significant reduction in a margin of safety?

Response:

There are no changes in the design, design basis, or operation of IP3 associated with the proposed change. Existing surveillance, inspection, testing and maintenance practices and procedures provide assurance that any degradation of equipment, structures or components will be identified and corrected throughout the lifetime of the plant. These measures together with the continued operation of IP3 in accordance with the Technical Specifications assure that an adequate margin of safety is preserved on a continuous basis. Therefore, the proposed change does not result in a significant reduction in a margin of safety.

The Authority considers that the proposed change can be classified as not likely to involve a significant hazards consideration since IP3 was originally designed for a 40 year life and measures are in place to ensure its continued safe operation.

Section IV - Impact of Change

This change will not adversely impact the following:

- ALARA Program
- Security and Fire Protection Programs
- Emergency Plan
- FSAR or SER Conclusions
- Overall Plant Operations and the Environment

Section V - Conclusions

The incorporation of this change: a) will not increase the probability nor the consequences of an accident or malfunction of equipment important to safety as previously evaluated in the Safety Analysis Report; b) will not increase the possibility for an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report; c) will not reduce the margin of safety as defined in the bases for any Technical Specification; d) does not constitute an unreviewed safety question; and e) involves no significant hazards considerations as defined in 10 CFR 50.92.

Section VI - References

- a) IP-3 FSAR
- b) IP-3 SER
- c) WCAP-11045, Revision 1 "Indian Point Unit 3 Reactor Vessel Fluence And RT_{PTS} Evaluations"
- d) "Environmental Report - Indian Point Unit No. 3"
- e) "Final Environmental Statement Related to Operation of Indian Point Nuclear Generating Plant, Unit No. 3" (NUREG-75/002 and NUREG-75/003) February 1975

TABLE 1
RECENT OFFSITE DOSE ASSESSMENTS*

<u>PATHWAY</u>	<u>MAXIMUM TOTAL BODY DOSE (mr)</u>
Gaseous Pathway: Noble Gases	3.52E-02
Radiodines, Particulates and Tritium	8.85E-04
Liquid Pathway: All Releases	3.31E-02

* Based on the period of January 1, through December 31, 1989.

TABLE 2
 NUCLEAR FUEL DISCHARGE INFORMATION
 INDIAN POINT 3

Cycle No.	Shutdown Dates	Number of Assemblies Discharged	Cumulative Total No. Spent Fuel Assemblies In Pool
01	6/1978	64	64
02	9/1979	76	140
03	3/1982	76	216
04	6/1985	76	292
05	5/1987	76	368
06	2/1989	64	432

(ACTUAL CYCLE INFORMATION THROUGH CYCLE 06, PROJECTED THEREAFTER)

07	9/1990	74	505
08	3/1992	84	589
09	3/1994	84	673
10	6/1996	84	757
11	5/1998	84	841
12	3/2000	84	925
13	3/2002	84	1009
14	3/2004	84	1093
15	3/2006	84	1177 ⁽¹⁾
16	3/2008	84	1261
17	3/2010	84	1345 ⁽²⁾
18	3/2012	84	1429
19	3/2014	84	1513
END OF LIFE	12/2015	193 FINAL OFFLOAD	1706

1. FULL CORE RESERVE (FCR) LOST AT 1152 CELLS WITH MAX DENSITY RACKS.
2. ALL DISCHARGE CAPABILITY LOST (LICENSED SPENT FUEL POOL CAPACITY OF 1345 FUEL ASSEMBLIES).