

December 4, 1997

Mr. J. P. O'Hanlon
Senior Vice President - Nuclear
Virginia Electric and Power Company
5000 Dominion Blvd.
Glen Allen, Virginia 23060

SUBJECT: NORTH ANNA POWER STATION, UNITS 1 AND 2 - ISSUANCE OF AMENDMENTS
REGARDING A PROPOSED TECHNICAL SPECIFICATION CHANGE TO SURVEILLANCE
REQUIREMENTS FOR THE TURBINE OVERSPEED PROTECTION SYSTEM
(TAC NOS. M98845 AND M98846)

Dear Mr. O'Hanlon:

The Commission has issued the enclosed Amendment Nos. 207 and 188 to Facility Operating License Nos. NPF-4 and NPF-7 for the North Anna Power Station, Units No. 1 and No. 2 (NAPS-1&2). The amendments consist of changes to the Technical Specifications (TS) in response to your letter dated May 14, 1997, as supplemented October 15, 1997.

The amendments in the form of changes to the TS revise the Surveillance Requirement 4.7.1.7.2.a for both units to clarify the testing and inspection methodology of the turbine governor control valves. The proposed changes also provide clarification in TS Bases Section 3/4.7.1.7 for the Turbine Valve Freedom Testing of the turbine governor control valves.

A copy of the Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

Original signed by:
N. Kalyanam, Project Manager
Project Directorate II-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket Nos. 50-338 and 50-339

Enclosures:

1. Amendment No. 207 to NPF-4
2. Amendment No. 188 to NPF-7
3. Safety Evaluation

cc w/enclosures: See next page

DISTRIBUTION

See attached sheet

*Previously Concurred

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NAME	NKalyanam	Dunnington	JLyons		
DATE	11/13/97	11/13/97	12/2/97	11/19/97	04/08/97
COPY	Yes/No	<input checked="" type="checkbox"/> Yes/No	Yes/No	<input checked="" type="checkbox"/> Yes/No	Yes/No

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NRC FILE NUMBER 971204



DATED: December 4, 1997

AMENDMENT NO. 207 TO FACILITY OPERATING LICENSE NO. NPF-4-NORTH ANNA UNIT 1
AMENDMENT NO. 188 TO FACILITY OPERATING LICENSE NO. NPF-7-NORTH ANNA UNIT 2

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North Anna Power Station
Units 1 and 2

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

VIRGINIA ELECTRIC AND POWER COMPANY

OLD DOMINION ELECTRIC COOPERATIVE

DOCKET NO. 50-338

NORTH ANNA POWER STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 207
License No. NPF-4

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Virginia Electric and Power Company et al., (the licensee) dated May 14, 1997, as supplemented by letter dated October 15, 1997, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

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2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.D.(2) of Facility Operating License No. NPF-4 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 207, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



James E Lyons, Director
Project Directorate II-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: December 4, 1997

ATTACHMENT TO LICENSE AMENDMENT NO. 207

TO FACILITY OPERATING LICENSE NO. NPF-4

DOCKET NO. 50-338

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages as indicated. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

Remove Pages

3/4 7-15
B 3/4 7-4
B 3/4 7-4a

Insert Pages

3/4 7-15
B 3/4 7-4
B 3/4 7-4a

PLANT SYSTEMS

TURBINE OVERSPEED

LIMITING CONDITION FOR OPERATION

3.7.1.7 At least one turbine overspeed protection system shall be OPERABLE.

APPLICABILITY: MODE 1, 2 and 3

ACTION:

With the above required turbine overspeed protection system inoperable, within 6 hours either restore the system to OPERABLE status or isolate the turbine from the steam supply.

SURVEILLANCE REQUIREMENT

4.7.1.7.1 The provisions of Specification 4.0.4 are not applicable.

4.7.1.7.2 The above required turbine overspeed protection system shall be demonstrated OPERABLE:

- a. By cycling each of the following valves through at least one complete cycle from the running position and verifying movement of each of the valves through one complete cycle from the running position by direct observation:
 1. Four Turbine Throttle valves at least once per 31 days,
 2. Four Turbine Governor valves at least once per 31 days, *
 3. Four Turbine Reheat Stop valves at least once per 18 months, and
 4. Four Turbine Reheat Intercept valves at least once per 18 months.
- b. At least once per 18 months, by performance of CHANNEL CALIBRATION on the turbine overspeed protection instruments.
- c. At least once per 40 months **, by disassembly of at least one of each of the above valves and performing a visual and surface inspection of all valve seats, disks and stems and verifying no unacceptable flaws or corrosion. If unacceptable flaws or excessive corrosion are found, all other valves of that type shall be inspected unless the nature of the problem can be attributed to a service condition specific to that valve.

* Testing of the turbine governor valves may be suspended during end-of-cycle power coastdown operation between 835 MWe and 386 MWe.

** For reheat stop and reheat intercept valves, the inspection cycle may be increased to a maximum of once per 60 months provided there is no indication of operational distress.

PLANT SYSTEMS

BASES

3/4.7.1.6 and 3/4.7.1.7 STEAM TURBINE and OVERSPEED PROTECTION

The turbine generator at the North Anna facility is arranged in a nonpeninsular orientation. Analysis has shown that this arrangement is such that if a turbine failure occurs as a result of destructive overspeed, potentially damaging missiles could impact the auxiliary building, containment, control room and other structures housing safety related equipment. The requirements of these two specifications provide additional assurance that the facility will not be operated with degraded valve performance and/or flawed turbine material which are the major contributors to turbine failures.

The turbine governor valves are required to be tested through one complete cycle from the running position. In normal operation, one or more governor valves may be less than fully open. Based upon the Westinghouse Technical Manual Operating Instructions, these valves are tested from the operating position to the full closed position and back to their pretest position. The deliberate opening of the last governor valve beyond its normal operating position would likely result in an unstable valve configuration. The purpose of the test is to verify that the governor valves will close from their normal operating position to the fully closed position.

3/4.7.2 STEAM GENERATOR PRESSURE/TEMPERATURE LIMITATION

The limitation on steam generator pressure and temperature ensures that the pressure induced stresses in the steam generators do not exceed the maximum allowable fracture toughness stress limits. The limitations of 70°F and 200 psig are based on average steam generator impact values at 10°F and are sufficient to prevent brittle fracture.

3/4.7.3.1 COMPONENT COOLING WATER SUBSYSTEM – OPERATING

The component cooling water system normally operates continuously to remove heat from various plant components and to transfer the heat to the service water system. The system consists of four subsystems shared between units, with each subsystem containing one pump and one heat exchanger.

The current design basis for the component cooling water system is a fast cooldown of one unit while maintaining normal loads on the other unit. Three component cooling water subsystems need to be OPERABLE to accomplish this function. The fourth subsystem is a spare and may be out of service indefinitely. With only two component cooling water subsystems a slow cooldown on one unit while maintaining normal loads on the opposite unit can be accomplished.

The component cooling water system is designed to reduce the temperature of the reactor coolant system from 350°F to 140°F within 16 hours during plant cooldown, based on a service water temperature of 95°F and on having two component cooling water pumps and two heat exchangers in service for the unit being cooled down. Therefore, to ensure cooldown of one unit within 16 hours and maintain the other unit in normal full power operation three of the four subsystems must be OPERABLE.

Because subsystems are placed in standby by shutting down pumps and isolating heat exchangers and this system serves no accident mitigation functions, the subsystem is considered OPERABLE in the standby conditions since it can be easily placed in service quickly by manual operator actions.

PLANT SYSTEMS

BASES

3/4.7.3.2 COMPONENT COOLING WATER SUBSYSTEM – SHUTDOWN

The OPERABILITY of the component cooling water system when both units are in COLD SHUTDOWN or REFUELING ensures that an adequate heat sink is maintained for the residual heat removal system.

3/4.7.4.1 SERVICE WATER SYSTEM – OPERATING

The OPERABILITY of the service water system ensures that sufficient cooling capacity is available for safety related equipment during normal and accident conditions. The system is designed to meet the assumption of a single failure. During a design basis accident, both loops of service water cross-connect at the affected units recirculation spray heat exchangers to create a single large service water system. The affected units component cooling heat exchangers isolate so that sufficient flows are provided to both the non-affected and affected units components.

With four normal service water pumps OPERABLE, the unthrottled flow resistance of the system is such that greater than design flows are achieved if a single pump or power supply failure occurs following an accident. When three normal service water pumps are OPERABLE, the flow resistance of the system is adjusted to ensure that design flows are achieved if a single pump or power supply failure occurs following an accident. The required resistance is determined during periodic flow balance testing and is obtained by throttling flow through the component cooling water heat exchangers. Rather than marking and specifying exact component cooling water heat exchanger outlet throttle valve positions, operating procedures have been established to set system resistance at or greater than the required resistance. When only two normal service water pumps or a single loop are OPERABLE, the design basis function can still be met provided that the flow resistance of the system is adjusted and no additional failures occur. The allowed outage time of 72 hours is consistent with other LCOs for loss of one train of ESF systems, and is based upon an industry accepted practice considering the low probability of an accident occurring.

If more than two normal service water pumps or both service water loops are inoperable, the units are not prepared to respond to the design basis events for which the service water system is required. Both units must be placed in HOT SHUTDOWN within twelve hours and actions initiated within one hour thereafter to place the units in COLD SHUTDOWN. Twelve hours is a reasonable time based on operating experience to place the units in HOT SHUTDOWN from full power without challenging safety systems or operators. The units may remain in HOT SHUTDOWN until a method to further cool the units becomes available, but actions to develop the method must be started within one hour after reaching HOT SHUTDOWN.

Auxiliary service water pumps are strictly a backup subsystem and are not taken credit for in a design basis accident. However, these pumps are taken credit for in the 10 CFR 50, Appendix R, analysis. Therefore, these pumps are maintained OPERABLE in MODES 1, 2, 3, and 4 to meet these requirements.



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
WASHINGTON, D.C. 20555-0001

VIRGINIA ELECTRIC AND POWER COMPANY

OLD DOMINION ELECTRIC COOPERATIVE

DOCKET NO. 50-339

NORTH ANNA POWER STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 188
License No. NPF-7

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Virginia Electric and Power Company et al., (the licensee) dated May 14, 1997, as supplemented by letter dated October 15, 1997, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

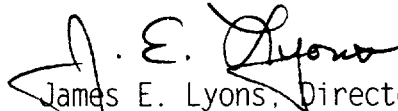
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-7 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 188 , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



James E. Lyons, Director
Project Directorate II-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: December 4, 1997

ATTACHMENT TO LICENSE AMENDMENT NO. 188

TO FACILITY OPERATING LICENSE NO. NPF-7

DOCKET NO. 50-339

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages as indicated. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

Remove Pages

3/4 7-12
B 3/4 7-4
B 3/4 7-4a

Insert Pages

3/4 7-12
B 3/4 7-4
B 3/4 7-4a

PLANT SYSTEMS

TURBINE OVERSPEED

LIMITING CONDITION FOR OPERATION

3.7.1.7 At least one turbine overspeed system shall be OPERABLE.

APPLICABILITY: MODE 1, 2 and 3

ACTION:

With the above required turbine overspeed protection system inoperable, within 6 hours either restore the system to OPERABLE status or isolate the turbine from the steam supply.

SURVEILLANCE REQUIREMENT

4.7.1.7.1 The provisions of Specification 4.0.4 are not applicable.

4.7.1.7.2 The above required turbine overspeed protection system shall be demonstrated OPERABLE:

- a. By cycling each of the following valves through at least one complete cycle from the running position and verifying movement of each of the valves through one complete cycle from the running position by direct observation:
 1. Four Turbine Throttle valves at least once per 31 days,
 2. Four Turbine Governor valves at least once per 31 days, *
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* Testing of the turbine governor valves may be suspended during end-of-cycle power coastdown operation between 835 MWe and 386 MWe.

** For reheat stop and reheat intercept valves, the inspection cycle may be increased to a maximum of once per 60 months provided there is no indication of operational distress.

PLANT SYSTEMS

BASES

3/4.7.1.6 and 3/4.7.1.7 STEAM TURBINE and OVERSPEED PROTECTION

The turbine generator at the North Anna facility is arranged in a nonpeninsular orientation. Analysis has shown that this arrangement is such that if a turbine failure occurs as a result of destructive overspeed, potentially damaging missiles could impact the auxiliary building, containment, control room and other structures housing safety related equipment. The requirements of these two specifications provide additional assurance that the facility will not be operated with degraded valve performance and/or flawed turbine material which are the major contributors to turbine failures.

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3/4.7.3.1 COMPONENT COOLING WATER SUBSYSTEM – OPERATING

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The component cooling water system is designed to reduce the temperature of the reactor coolant system from 350°F to 140°F within 16 hours during plant cooldown, based on a service water temperature of 95°F and on having two component cooling water pumps and two heat exchangers in service for the unit being cooled down. Therefore, to ensure cooldown of one unit within 16 hours and maintain the other unit in normal full power operation three of the four subsystems must be OPERABLE.

Because subsystems are placed in standby by shutting down pumps and isolating heat exchangers and this system serves no accident mitigation functions, the subsystem is considered OPERABLE in the standby conditions since it can be easily placed in service quickly by manual operator actions.

PLANT SYSTEMS

BASES

3/4.7.3.2 COMPONENT COOLING WATER SUBSYSTEM – SHUTDOWN

The OPERABILITY of the component cooling water system when both units are in COLD SHUTDOWN or REFUELING ensures that an adequate heat sink is maintained for the residual heat removal system.

3/4.7.4.1 SERVICE WATER SYSTEM – OPERATING

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 207 AND 188 TO

FACILITY OPERATING LICENSE NOS. NPF-4 AND NPF-7

VIRGINIA ELECTRIC AND POWER COMPANY

OLD DOMINION ELECTRIC COOPERATIVE

NORTH ANNA POWER STATION, UNITS NO. 1 AND NO. 2

DOCKET NOS. 50-338 AND 50-339

1.0 INTRODUCTION

By application dated May 14, 1997, as supplemented by letter dated October 15, 1997, Virginia Electric and Power Company (the licensee) submitted a request for changes to the North Anna Power Station, Units 1 and 2, Technical Specifications (TS). The requested changes would revise Surveillance Requirement (SR) 4.7.1.7.2.a for the turbine overspeed protection system to reflect the Virginia Electric and Power Company's current valve testing and verification of valve movement methodology for cycling the turbine control valves through at least one complete cycle by requiring that each of the turbine control valves be cycled and the movement verified through at least one complete cycle from the running position. The licensee also proposes to revise TS BASES Sections 3/4.7.1.6 and 3/4.7.1.7 to clarify the testing requirements for the turbine governor control valves.

The October 15, 1997, submittal contained clarifying information only, and did not change the proposed no significant hazards consideration determination.

2.0 BACKGROUND

North Anna, Units 1 and 2, are each equipped with a Westinghouse turbine generator. The Westinghouse turbine is a conventional 1800-rpm, tandem-compound unit consisting of one double-flow, high-pressure cylinder and two double-flow, low-pressure cylinders. The turbine is provided with four moisture separator reheaters located between the high-pressure and the low-pressure cylinders.

Each high-pressure steamline to the high-pressure cylinder contains a stop-trip (throttle) valve and a governor control valve. A reheat stop valve and an intercept valve are provided in the crossover piping between each moisture separator reheater and the low-pressure turbine cylinders.

The turbine generator system is equipped with overspeed protection to minimize the probability of the generation of turbine missiles to ensure conformance with General Design Criterion (GDC) 4, "Environmental and Dynamic Effects Design Bases." To demonstrate the operability of the turbine overspeed protection system, TS 4.7.1.7.2.a currently requires that the four turbine throttle valves, the four turbine governor valves, the four turbine reheat stop valves, and the four turbine reheat intercept valves be tested by cycling each of the valves through one complete cycle of full travel and verifying movement of each of the valves through one complete cycle by direct observation.

The licensee proposed revising TS 4.7.1.7.2.a because of concerns regarding the testing of turbine governor valves through one complete cycle of full travel. The licensee also maintains that the definition of "full travel" is not specifically provided in the TS. The proposed changes would clarify the SR wording to reflect the Virginia Electric and Power Company's current valve testing and verification of valve movement methodology for cycling the valves through at least one complete cycle. The licensee stated that depending on the turbine power at the time of testing, one or more of the governor valves would be less than fully open. Therefore, the governor valves are cycled from their running position to the full-closed position and back to the running position during each turbine overspeed protection surveillance test. The licensee's submittal of October 15, 1997, stated that during plant operations with the generator connected to the grid, the four intercept valves, the four reheat stop valves, and the four throttle valves are full open, and they are not designed to function in an intermediate position. Therefore, these valves are cycled from their running position (full open) when tested pursuant to TS 4.7.1.7.2.a.

The licensee proposed rewording SR 4.7.1.7.2.a to clarify the test performance and verification of movement requirements for the turbine overspeed protection system. Currently, operability of the turbine overspeed protection system is demonstrated as follows:

Existing TS

- a. By cycling each of the following valves through one complete cycle of full travel and verifying movement of each of the valves through one complete cycle by direct observation:

The licensee proposed that operability of the turbine overspeed protection system be demonstrated as follows:

- a. By cycling each of the following valves through at least one complete cycle from the running position and verifying movement of each of the valves through one complete cycle from the running position by direct observation:

In addition, the licensee also proposes to revise TS BASES Sections 3/4.7.1.6 and 3/4.7.1.7 to clarify the testing requirement for the turbine governor control valves by adding the following:

The turbine governor valves are required to be tested through one complete cycle from the running position. In normal operation, one or more governor valves may be less than fully open. Based upon the Westinghouse Technical Manual Operating Instructions, these valves are tested from the operating position to the full closed position and back to their pretest position. The deliberate opening of the last governor valve beyond its normal operating position would likely result in an unstable valve configuration. The purpose of the test is to verify that the governor valves will close from their normal operating position to the fully closed position.

3.0 EVALUATION

Section 10.2 of the Standard Review Plan, NUREG-0800, provides guidance in evaluating the inservice inspection and testing of essential valves. The purpose of the guidance is to ensure that the turbine overspeed protection system will perform in a manner that satisfies the requirements of GDC 4 of Appendix A to 10 CFR Part 50 with regard to the protection of structures, systems, and components important to safety from the effects of turbine missiles.

The staff has reviewed the licensee's submittal as previously discussed and finds that clarifying that the valves be cycled and that movement be verified through at least one complete cycle from the running position is consistent with NUREG-0452, "Standard Technical Specifications for Westinghouse Pressurized Water Reactors," is consistent with the current North Anna Periodic Test Procedures and Westinghouse Operating Instructions, and also does not involve a reduction in the margin of safety and, therefore, is acceptable.

4.0 SUMMARY

The staff has completed its review of the licensee's amendment request to clarify the testing and inspection methodology of the turbine governor valves, the throttle valves, the reheat stop valves, and the reheat intercept valves, and concludes that the proposed changes are acceptable based on the above evaluation.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Virginia State official was notified of the proposed issuance of the amendments. The State official had no comment.

6.0 ENVIRONMENTAL CONSIDERATION

These amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and change a surveillance requirement. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluent that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that these amendments involve no significant hazards consideration and there has been no public comment on such finding (62 FR 40860). Accordingly, these amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

7.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

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