

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-410/86-49

Docket No. 50-410

License No. CPPR-112 Category B

Licensee: Niagara Mohawk Power Corporation
300 Erie Boulevard West
Syracuse, New York 13202

Facility Name: Nine Mile Point Unit 2

Inspection At: Scriba, New York

Inspection Conducted: August 18-22, 1986

Inspectors: Margaret E. Kramaric for
R. K. Struckmeyer, Radiation Specialist

9/18/86
date

Margaret E. Kramaric
M. E. Kramaric, Radiation Specialist

9/18/86
date

Approved by: W. J. Pasciak
W. J. Pasciak, Chief, Effluents Radiation
Protection Section

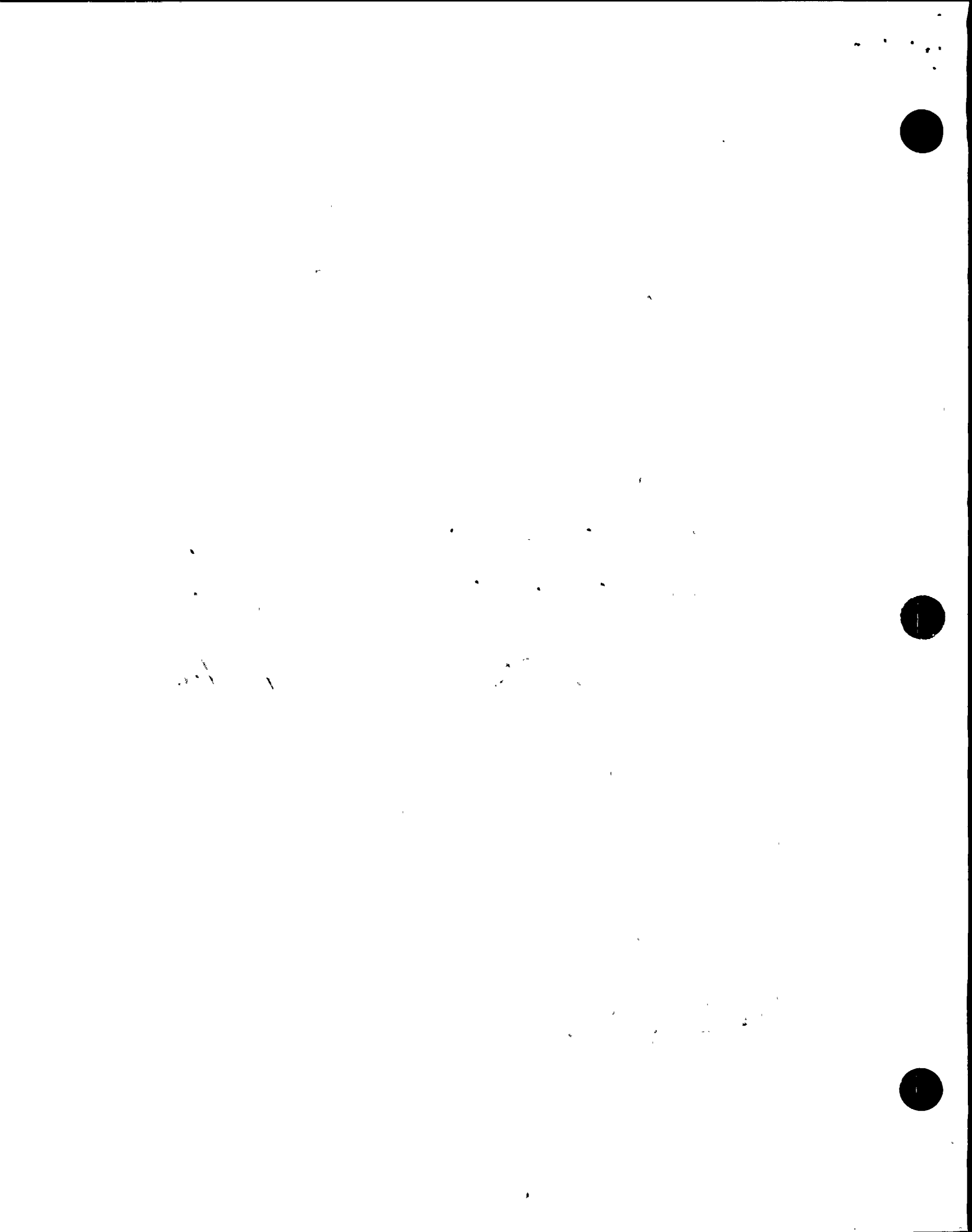
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Inspection Summary: Inspection conducted August 18-22, 1986 (Inspection Report No. 50-410/86-49)

Areas Inspected: Routine, announced inspection to review the status of previously identified items in the areas of radiochemistry, liquid and gaseous radioactive waste, and effluent control.

Results: No violations or deviations were identified.

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DETAILS

1. Individuals Contacted

- *R. Abbott, Station Superintendent
- S. Agarwal, Special Projects
- B. Bock, Assistant Unit Supervisor, Chemistry
- D. Currier, Assistant Respiratory Protection Supervisor
- J. Drake, SWEC Startup/Test Special Projects Supervisor
- *J. Duell, Supervisor, Radiation Protection and Chemistry
- P. Eddy, Site Representative, New York PSC
- *P. Farsaci, Assistant QA Engineer
- *M. Goldych, Assistant Supervisor, Training
- W. Hansen, Manager, Nuclear QA Operations
- D. Kryszczynski, SWEC Test Engineer
- M. Lane, Associate Senior Construction Engineer
- J. Lawton, Chemistry
- *E. Leach, Superintendent, Chemistry/Radiation Mgt.
- *T. Lee, Special Projects
- *M. Ray, Manager, Special Projects
- *A. Ross, Unit Supervisor, Chemistry
- *I. Weakly, Special Projects

2. Status of Previously Identified Items

(Open) Followup Item (410/85-20-03): This item refers to preoperational testing of safety-related ventilation systems; in particular the Control Room and Standby Gas Treatment systems. During this inspection, the status of preoperational tests of non-safety-related ventilation systems was reviewed. This is discussed further in Section 3.

(Closed) Followup Item (410/85-32-05): Review GEMS testing. The inspector reviewed Procedure Number N2-POT-80A-2, Rev. 1, "Gaseous Effluent Monitor System," and noted that preoperational testing of the GEMS system has been completed. The test has been reviewed and approved except for the final signature of the Station Superintendent for "system operational" status. This final approval is not given until the Joint Test Group (JTG) has reviewed the resolution of outstanding Deficiency Reports (DRs) and found these resolutions acceptable. The licensee had identified seven DRs as important to be completed before fuel load. Five of these had been reviewed and approved by JTG as of the conclusion of this inspection. The inspector stated that the resolution of the remaining DRs will be tracked as an Inspector Followup Item (410/86-49-01).

(Open) Followup Item (410/85-17-01): Calibration of counting equipment. Calibration of the counting room gamma spectrometers was reviewed in Inspection Report No. 410/86-35. Calibration and capability testing of the GEMS were reviewed in this inspection. This item is discussed further in Section 4.



(Closed) Followup Item (410/86-17-02): Review and approval of procedures. The licensee has completed and approved those chemistry surveillance procedures (N2-CSPs) necessary to support fuel load with the exception of S-CRIP-1, "Gamma Spectrometry." This procedure is referenced by several of the N2-CSPs. Pending completion of S-CRIP-1, the licensee issued a temporary Change Notice for each affected procedure that changes the reference to the corresponding Unit 1 procedure, V.A.7-N, "Operation and Calibration of the GeLi-1 and GeLi-2 Gamma Spectroscopy Systems." The licensee stated that this procedure and the Unit 1 counting equipment will be used until S-CRIP-1 is written and approved. The licensee stated that S-CRIP-1 will be completed by September 5, 1986. The inspector stated that this procedure will be reviewed in a subsequent inspection (410-/86-49-02). The inspector also reviewed selected chemistry surveillance procedures to determine whether the implementation of Technical Specifications requirements is consistent with the Offsite Dose Calculation Manual methodology. These procedures appear to be adequate in this regard.

(Closed) Followup Item (410/85-17-03): Laboratory QA Program. The inspector reviewed procedure N2-CSP-15, "Quality Assurance of Chemistry/Radiochemistry Analytical Results." This procedure now addresses the concerns stated in Inspection Report No. 410/86-17, except verification of computer software, which is covered by Procedure No. RDP-30.

3. Ventilation System Testing

The inspector reviewed the status of preoperational tests of non-safety-related ventilation systems, including HEPA filters and carbon absorbers. The following systems were reviewed:

- 2HVW FN 2A&B/FLT 6A&B, Radwaste Area Exhaust (HEPA only)
- 2HVW FN 3A&B/FLT 4A&B, Radwaste Equipment Exhaust (HEPA only)
- 2HVR FN6/FLT 3, Reactor Head Evacuation Filters (HEPA, Carbon HEPA)
- 2HVW FN13/FLT 101, PASS System (HEPA, Carbon)
- 2HVW FN 10 A&B/FLT 100 A&B, Decontamination Building Exhaust (HEPA only)
- 2HVW FN 4/FLT 8, Liner Filling Hood Exhaust (HEPA only)
- 2 OFG FLT 1A & B (HEPA, Carbon)

The inspector reviewed the following preoperational tests relevant to these systems:

- MV. GENE..004, Special Filter Housing Test



- ° MV. GENE. 005, In-Place Testing of HEPA Filters and Carbon Absorbers
- ° MV. GENE. 006, Air-Aerosol Mixing Uniformity
- ° MV. GENE. 007, Air Flow Capacity and Distribution

Within the scope of this review, the following concerns were identified:

- ° Tests of the PASS ventilation (2 HVW FN 13/FLT 101) were performed at a flow rate of 26.1 cfm. The design flow rate for this system is 40 cfm. The licensee stated that a decision had not yet been made as to whether the design flow rate would remain at 40 cfm or be lowered. The current tests of this system can not be considered acceptable unless the flow rate is lowered to approximately 26 cfm, and this flow rate is justified. The licensee stated that the final design flow rate is likely to be greater than 26 cfm; thus retesting would be necessary.
- ° Simulated dirty filter tests were performed on these ventilation systems. Tests of two systems Train A of the Liner Filling Hood (2 HVW FN 4/FLT 8) and Train B of the Radwaste Equipment Exhaust (2 HVW FN 3 A&B/FLT 4 A&B) resulted in flow rates that were more than 10% below the required design flow rate. These systems were tested in accordance with ANSI/ASME N509-1980, which allows a maximum of $\pm 10\%$ variation from the design flow. The licensee stated that these systems will be retested and the necessary adjustments made to satisfy the acceptance criterion.

These test results will be reviewed in a future inspection (410/86-49-03).

4. GEMS Capability Test

Test samples were submitted to the licensee in order to evaluate the licensee's capability to measure radioactivity in effluents using the Gaseous Effluent Monitoring System (GEMS) for the Unit 2 stack and vent. The test samples duplicated the types of samples and nuclides that the licensee would encounter during operation. The test samples were analyzed by the licensee using the licensee's normal methods and equipment.

These tests were conducted on two of the three radiation detection channels in each GEMS unit, the iodine channel and the particulate channel. These tests were performed using respectively, a simulated charcoal cartridge and a simulated particulate filter in the configurations appropriate to the GEMS design. The noble gas channel was not tested due to the unavailability of a suitable test sample. However, the adequacy of the calibration of this channel, as well as the iodine and particulate channels, was reviewed for each GEMS unit.



The results of the test samples measurement comparison indicated that all of the measurements were in agreement, with the exceptions noted below, under the criteria used for intercomparison of results (given in Attachment I). The intercomparison data is listed in Table 1.

The exceptions referred to in the previous paragraph concern measurements of radioactivity at very low energies.

The Vent and Stack GEMS particulate detectors were in agreement at energies of 0.166 MeV and 0.122 MeV and above respectively. The Vent and Stack GEMS iodine detectors were in agreement at energies of 0.393 MeV and 0.166 MeV and above respectively. The disagreements may be due to the licensee's use of a cadmium shield surrounding each detector. The purpose of this shield is to prevent saturation of the detector should an accident occur in which large quantities of low energy radioactivity might be released (e.g. Xe-133, 0.081 MeV).

The inspector reviewed the calibrations of the noble gas detectors for the vent and stack GEMS. It was noted that the licensee recently performed calibration checks, using sources containing the same radionuclides as used in the original calibration. The data obtained in these checks was plotted on log-log graph paper along with the original calibration data. The curves obtained in this manner should closely coincide, within the limits of statistical counting error. However, there were significant discrepancies that could not be readily explained. Efforts are continuing to understand and resolve this problem.

If the problems with the GEMS detectors are not resolved prior to fuel load, the licensee stated that samples will be obtained using these systems, but analyses will be performed using laboratory gamma spectroscopy equipment. This is in accordance with the licensee's Technical Specifications.

5. Exit Interview

The inspector met with licensee representatives denoted in Paragraph 1 at the conclusion of the inspection on August 22, 1986. The inspector summarized the purpose and scope of the inspection, and discussed the findings. At no time during this inspection was written material provided to the licensee by the inspector.



ATTACHMENT I

CRITERIA FOR COMPARING ANALYTICAL MEASUREMENTS

This attachment provides criteria for comparing results of capability tests and certification measurements. The criteria are based on an empirical relationship which combines prior experience and the accuracy needs of this program.

In these criteria, the judgement limits are variable in relation to the comparison of the NRC Reference Laboratory's value to its associated uncertainty. As that ratio, referred to in this program as "Resolution", increases the acceptability of a licensee's measurement should be more selective. Conversely, poorer agreement must be considered acceptable as the resolution decreases.

<u>Resolution</u> ¹	<u>Ratio For Agreement</u> ²
<3	0.4 - 2.5
4 - 7	0.5 - 2.0
8 - 15	0.6 - 1.66
16 - 50	0.75 - 1.33
51 - 200	0.80 - 1.25
>200	0.85 - 1.18

¹Resolution = (NRC Reference Value/Reference Value Uncertainty)

²Ratio = (License Value/NRC Reference Value)



TABLE 1
NINE MILE POINT UNIT 2 CAPABILITY TEST RESULTS

SAMPLE	ISOTOPE	RESULTS IN m Ci/cc		COMPARISON
		NRC VALUE	LICENSEE VALUE	
Charcoal Cartridge Stack GEMS	Cd-109	(1.20 ± 0.06) E-07	(1.18 ± 0.04) E-07	Agreement
	Co-57	(1.19 ± 0.05) E-09	(7.51 ± 0.07) E-10	Disagreement *
	Ce-139	(6.6 ± 0.3) E-10	(5.19 ± 0.04) E-10	Agreement
	Sn-113	(8.7 ± 0.4) E-10	(7.30 ± 0.09) E-10	Agreement
	Cs-137	(1.07 ± 0.05) E-08	(9.47 ± 0.02) E-09	Agreement
	Co-60	(9.5 ± 0.4) E-09	(9.18 ± 0.02) E-09	Agreement
	Y-88	(1.07 ± 0.05) E-09	(1.08 ± 0.014) E-09	Agreement
Particulate Filter Stack GEMS	Cd-109	(5.1 ± 0.2) E-11	(4.4 ± 0.5) E-09	Disagreement *
	Co-57	(8.5 ± 0.2) E-11	(9.5 ± 0.5) E-11	Agreement
	Ce-139	(3.5 ± 0.2) E-11	(3.2 ± 0.2) E-11	Agreement
	Sn-113	(5.6 ± 0.5) E-11	(5.8 ± 0.4) E-11	Agreement
	Cs-137	(4.5 ± 0.2) E-09	(4.78 ± 0.02) E-09	Agreement
	Mn-54	(3.75 ± 0.15) E-10	(3.81 ± 0.08) E-10	Agreement
	Co-60	(3.98 ± 0.15) E-09	(4.29 ± 0.014) E-09	Agreement
Y-88	(8.6 ± 0.4) E-11	(1.09 ± 0.05) E-10	Agreement	
Charcoal Cartridge Vent GEMS	Cd-109	(1.18 ± 0.06) E-07	(9.87 ± 0.32) E-08	Agreement
	Co-57	(1.17 ± 0.06) E-09	(6.85 ± 0.05) E-10	Disagreement
	Ce-139	(6.6 ± 0.3) E-10	(4.33 ± 0.03) E-10	Disagreement
	Sn-113	(8.6 ± 0.4) E-10	(7.28 ± 0.08) E-10	Agreement
	Cs-137	(1.05 ± 0.05) E-08	(9.04 ± 0.02) E-09	Agreement
	Co-60	(9.4 ± 0.5) E-09	(8.37 ± 0.02) E-09	Agreement
	Y-88	(1.05 ± 0.05) E-09	(8.92 ± 0.13) E-10	Agreement
Particulate Filter Vent GEMS	Cd-109	(4.22 ± 0.16) E-11	<4.03 E-10	No Comparison
	Co-57	(7.0 ± 0.2) E-11	(5.0 ± 0.2) E-11	Disagreement *
	Ce-139	(2.9 ± 0.2) E-11	(2.3 ± 0.14) E-11	Agreement
	Sn-113	(4.7 ± 0.5) E-11	(5.3 ± 0.4) E-11	Agreement
	Cs-137	(3.76 ± 0.13) E-09	(3.98 ± 0.014) E-10	Agreement
	Mn-54	(3.12 ± 0.13) E-10	(3.26 ± 0.07) E-09	Agreement
	Co-60	(3.28 ± 0.12) E-09	(3.47 ± 0.01) E-09	Agreement
Y-88	(7.2 ± 0.4) E-11	(7.4 ± 0.3) E-11	Agreement	

* See text, paragraph 4

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