



Public Service Company of Colorado

January 30, 1979
Fort St. Vrain
Unit No. 1
P-79026

Mr. Themis P. Speis, Chief
Advanced Reactor Branch
Division of Project Management
Office of Nuclear Regulation
Washington, D.C. 20555

Docket #50-267

Subject: Region 35 Inspection

Reference: Speis to Fuller Letter
January 22, 1979

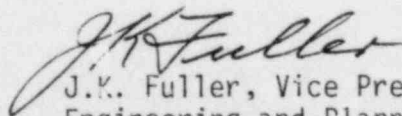
Gentlemen:

Per our discussion during the November 4 open meeting, we are transmitting for your information our general inspection plan for inspecting Region 35 during the upcoming refueling outage.

In your letter of January 22, 1979, you made inquiry as to inspection plans for other regions in light of the November 4, 1978, fluctuation. We are planning to refuel Regions 5, 10, 17, 21, 28 and 35 during the upcoming outage. A general visual inspection of the upper core plenum for each region will be made with the reactor viewing device prior to commencing fuel removal of the region, but we have no plans for any additional detailed inspections or surveillances of these regions other than Region 35.

The remainder of your inquiries in the January 22, 1979, letter will be addressed in separate correspondence.

Very truly yours,


J.K. Fuller, Vice President
Engineering and Planning

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FORT ST. VRAIN NUCLEAR GENERATING STATION
INSPECTION PLAN OUTLINE, REGION 35

Prepared by: Don Warembourg

Date: 1-19-79

I. General

The following outline provides the general inspection plan for inspecting Region 35 during the upcoming refueling outage. The inspection will consist of six (6) major areas as follows:

1. General core visual inspection
2. Core Region 35 block removal and inspection
3. Visual inspection, Region 35 core support structure
4. Dimensional inspection, Region 35 boundaries
5. Block inspection, selected elements of Region 35
6. General Core Mapping, Fuel element location, Region 35

The fuel handling machine (FHM) reactor viewing device (RVD) and the FHM viewing device will be utilized for in-core visual inspections. The FHM grapple head will be utilized for in-core dimensional inspection and core mapping; the hot service facility (HSF) will be utilized for visual inspection of the individual elements.

II. General Core Visual Inspection

1. Utilizing the FHM grapple head/RVD a general inspection of the upper portion of core will be performed, as indicated in Table A.
2. An inspection of the core orifice valves of regions 18, 34, and 36, will be performed to include visual observation for the following:
 - A. Valve stroke from full closed to full open to observe travel for unusual movement or binding.
 - B. Inspection of valve internals in full open position if possible.
 - C. Inspection of inner valve in full closed position for unusual wear marks if possible.

Inspection Plan Outline, Region 35 (continued)

III. Core Region 35 Block Removal Inspection

The element removal sequence for Region 35 is shown in Figure 1. Utilizing the FHM/RVD and the FHM viewing device, inspection will be performed as follows:

1. The blocks and surrounding area will be examined at each level of Region 35 before removal.
2. The sides of the blocks will be viewed in the FHM after removal from the core and two (2) pictures (180° apart) will be taken by the FHM viewing device.
3. The video tape will be utilized in all viewing segments.
4. The blocks will be inspected as outlined in Table B.
5. The visual inspection of Region 35 surrounding area will include those items outlined in Table C.

IV. Visual Inspection Region 35 Core Support Structure and Walls

1. Upon removal of Region 35 the FHM/RVD shall be utilized to visually inspect the Region 35 core support structure and to re-examine the caryon walls of Region 35, as necessary.
2. The inspection shall consist of those items outlined in Table C.

V. Dimensional Inspection, Region 35 Boundaries

1. Utilizing the FHM grapple head tangential, radial, and vertical readouts, in conjunction with a strip chart recorder and computer location data, measurements are to be made in eight (8) separate areas of Region 35, as indicated in Figure 2. Inspection of these areas shall be performed as follows:
 - A. The FHM grapple head will be positioned, utilizing previously established tangential and radial coordinates for the top metal plenum element.
 - B. Grapple head will be moved radially against the surface to be inspected to obtain a pre-established radial deflection.
 - C. Grapple head will be moved vertically down the face of the area being inspected at a speed of approximately 2 in/sec. Data will be recorded on the strip chart recorder and also monitored in digital readouts.
 - D. Data will be analyzed to determine block displacement or excessive gaps between blocks.

Inspection Plan Outline, Region 35 (continued)

VI. Block Inspection, Selected Elements of Region 35

1. Ten (10) blocks have been selected for visual inspection in Hot Service Facility (HSF). The location of these blocks is shown in Figure 1.
2. The ten (10) blocks will be stored in the FHM during the sequenced removal of Region 35. Upon completion of the removal of Region 35, the FHM will be positioned on the HSF for removal and inspection of the selected blocks.
3. Blocks will be inspected utilizing the general inspection plan outlined in Table B. Blocks will be observed at four (4) different positions as follows:
 - A. Bottom of block as it leaves the guide tube
 - B. Rotation of the block through 360°
 - C. Top of the block (in two separate positions 180° apart) after release by the FHM.
 - D. Observation will be compared with initial inspection records established for these blocks during initial fuel loading.

VII. Core Mapping

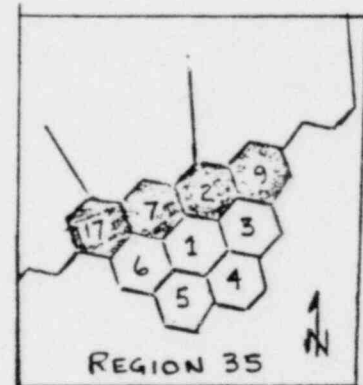
1. Utilizing computer data, the locations where each block in Region 35 is picked up will be recorded for comparison with theoretical locations to verify uniformity of the blocks at each level.

FIGURE 1

BLOCK REMOVAL SEQUENCE
Region 35

Sequence No. for
block removal of
Region 35.

	1	2	3	4	5	6	7
9	1	2	6	3	4	5	7
1	1	5	1	5	1	5	1
18	10	11	12	13	14	15	16
2	2	8	2	8	2	8	2
35	19	20	21	22	23	24	25
4	3	10	3	10	3	10	3
3	27	28	29	30	31	32	33
42	4	2	4	2	4	2	4
4	36	37	38	39	40	41	45
53	5	2	5	2	5	2	5
5	47	48	49	43	44	50	51
62	6	2	6	2	6	2	6
6	54	55	56	57	58	59	60
71	7	2	7	2	7	2	7
80	67	68	63	64	65	66	69
8	8	2	8	2	8	2	8
89	72	73	74	75	76	77	78
9	9	2	9	2	9	2	9
106	81	82	83	84	85	86	87
10	10	10	10	10	10	10	11
	90	91	92	93	94	95	102
	11	14	11	14	11	14	11
	96	97	99	98	100	101	104
	10	10	10	16	10	16	17



Indicates blocks
to be inspected
in H.S.F.

FIGURE 2
Region 35
Boundary Areas For
Dimensional Inspection

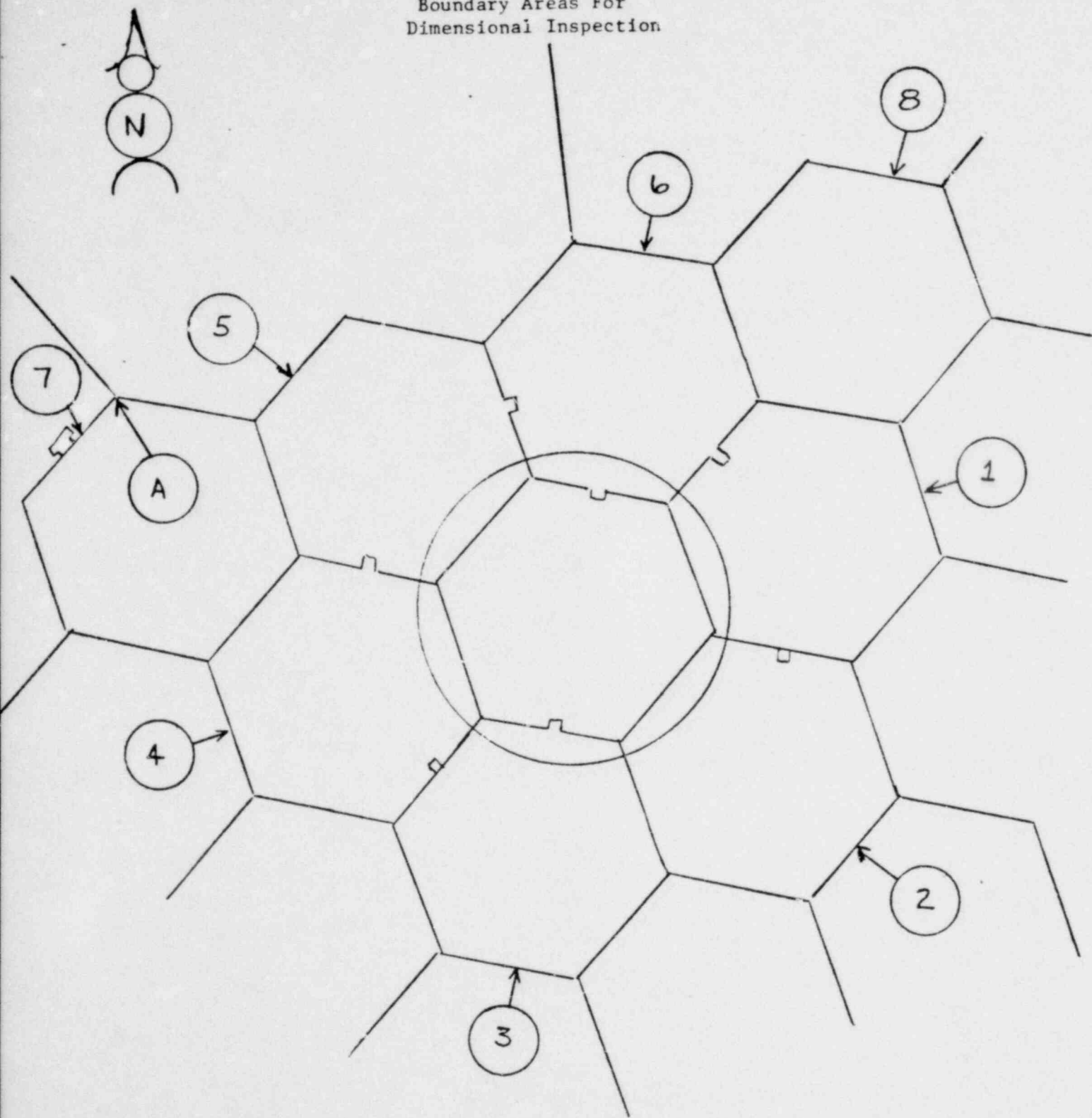


TABLE A
CORE VISUAL INSPECTION

COMPONENT	CRITERIA	INSPECTION RESULTS*
1. Thermal Barrier	No bowed or buckled plates; no distortion or surface damage. Seal sheets between cover plates.	
2. Upper edge of core barrel and top reflector keys	Barrel Upper edge shape is uniform. No distortion at key and barrel interface. Key assembly and bolting arrangement is in tact. No distortion at key and reflector block interface.	
3. Upper Plenum Elements	No tipped or displaced elements, uniform color and appearance. Gap uniformity between; (1) Plenum elements in a region (2) Plenum elements between regions and (3) Plenum elements and permanent side reflectors	
4. Control Rod Guide Tube. Region Orifice Valves R18, R34 and R36.	No distortion; fully engaged with plenum elements. No wear marks at valve/plenum element interface.	
5. Side Spacer Blocks	No tipped or displaced elements. Uniform color uniform gap between; (1) spacer blocks & core barrel, (2) spacer blocks & side reflector and (3) spacer blocks.	
6. Permanent Side Reflector Blocks	No tipped or displaced blocks; uniform gap between adjacent reflector blocks and reflector blocks and spacer blocks.	
*Include description of exact location for specific results.		

TABLE B

Block No. _____

BLOCK VISUAL INSPECTION

COMPONENT	CRITERIA	INSPECTION RESULTS*
1. Dowels & Sockets of fuel/reflector block.	No cracks or chips.	
2. Pads on Plenum Elements.	No indication of impact, rubbing or deterioration. No cracked or chipped edges.	
3. Key and key slots of Plenum Elements.		
4. Fuel/Reflector Blocks.	No cracked or chipped edges. No indication of impact or rubbing. No displaced blocks.	

*Include description of exact location for specific results.

TABLE C

VISUAL INSPECTION OF REGION 35 SURROUNDING AREA

COMPONENT	CRITERIA	INSPECTION RESULTS*
1. Region 36, 34 and 18 Faces & Gaps between adjacent Fuel/Reflector Columns of each region and between regions.	Gap size is uniform along entire length of column. No indication of impact, rubbing or deterioration, no cracked or chipped edges.	
2. Gap at position "A" as shown by <u>Figure 2</u> .	Uniform along entire length of column, no excessive gaps.	

*Include description of exact
location for specific results.