

[TABLE 2.5.3-1

1.18 x

LIST OF FAULTS

1.20

Fault	Attitude		Sense of Displacement in the Horizontal Plane	Amount of Apparent Displacement (ft)	Calculated Displacement (ft)	Remarks	1.23
	Strike	Dip					1.24
T-3	N28W	70E	Right Lateral	30-35	43	Mapped at the bedrock surface (NNECo. 1975) and again at final excavation grade. Described in Section 2.5.3.2.	1.25 1.26 1.28 1.29 1.30 1.31 1.32
T-2	N18W	70E	Right Lateral	7-8	10	Mapped at the bedrock surface (NNECo. 1975) and again at final excavation grade. Described in Section 2.5.3.2.	1.34 1.35 1.36 1.37 1.38
508	N02W	77E	Right Lateral	2-3	4-5	Mapped at the bedrock surface (NNECo. 1975).	1.40 1.41
1599	N06W	70E	Right Lateral	1	2	Fault shown in this report but discussed in detail in "Fault in the Demineralized and Refueling Water Tank Area" report (NNECo. 1977).	1.43 1.44 1.45 1.46 1.47
T-1	N02E	90	Left Lateral	1-2	1-2	Displaced by T-3 (NNECo. 1975).	1.49
18	N07E	68W	Left Lateral	1-2	2	Fault uncovered in the warehouse No. 5 - Unit 2 condensate polishing facility excavation. Discussed in separate report (NNECo. 1976) submitted to the NRC in June 1976.	1.51 1.52 1.53 1.54 1.55 1.56 1.57
47	N03W	85W	Left Lateral	1-3	2-3	Number used in the "Geologic Mapping of the Bedrock Surface" report (NNECo. 1975) corresponds to 461 and 1541 in this report.	1.59 1.60 2.1 2.2 2.3

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TABLE 2.5.3-1 (Cont)

Fault	Attitude		Sense of Displacement in the Horizontal Plane	Amount of Apparent Displacement (ft)	Calculated Displacement (ft)	Remarks
	Strike	Dip				
461	N05E	55E	Left Lateral	0.5		Corresponds to 1541 found in the auxiliary building. Extensive shear zone with very closely spaced joint planes. Joint surfaces are smooth with some slickensides (S-33). Crystalline quartz also evident within the fault.
1541	N01W	85W	Left Lateral	0.5		Continuation of #61. Extensive, severely weathered zone, 0.1 to 1.5 ft wide. Series of very closely spaced joints with some quartz coating chlorite and some clay filling.
555	N07W	55W	Left Lateral	1-2	3	Mapped at the bedrock surface (NNECo. 1975), corresponds to 368, observed at final grade.
368	N07W	55W	Left Lateral	2-3		Smooth surfaces with iron oxide staining and with some chlorite-clay filling and some crystalline quartz.
1182	N12W	90	Left Lateral	0.5		Small fault near T-3, iron oxide stained surfaces with some clay filling.
1208	N12W	75E	Right Lateral	2.5		Major shear splaying off at T-3, exhibits thick, white quartz coating and a filling of some green clay and fragments of weathered rock.
1228	N25W	75E	Right Lateral	2-3		Splays off of T-3, iron oxide stained surfaces with clay fillings.
75	⁰⁵ N06E	67SE	Right Lateral	2		Very thin, linear shear zone with crystalline quartz coating surfaces and chlorite staining.

TABLE 2.5.3-1 (Cont)

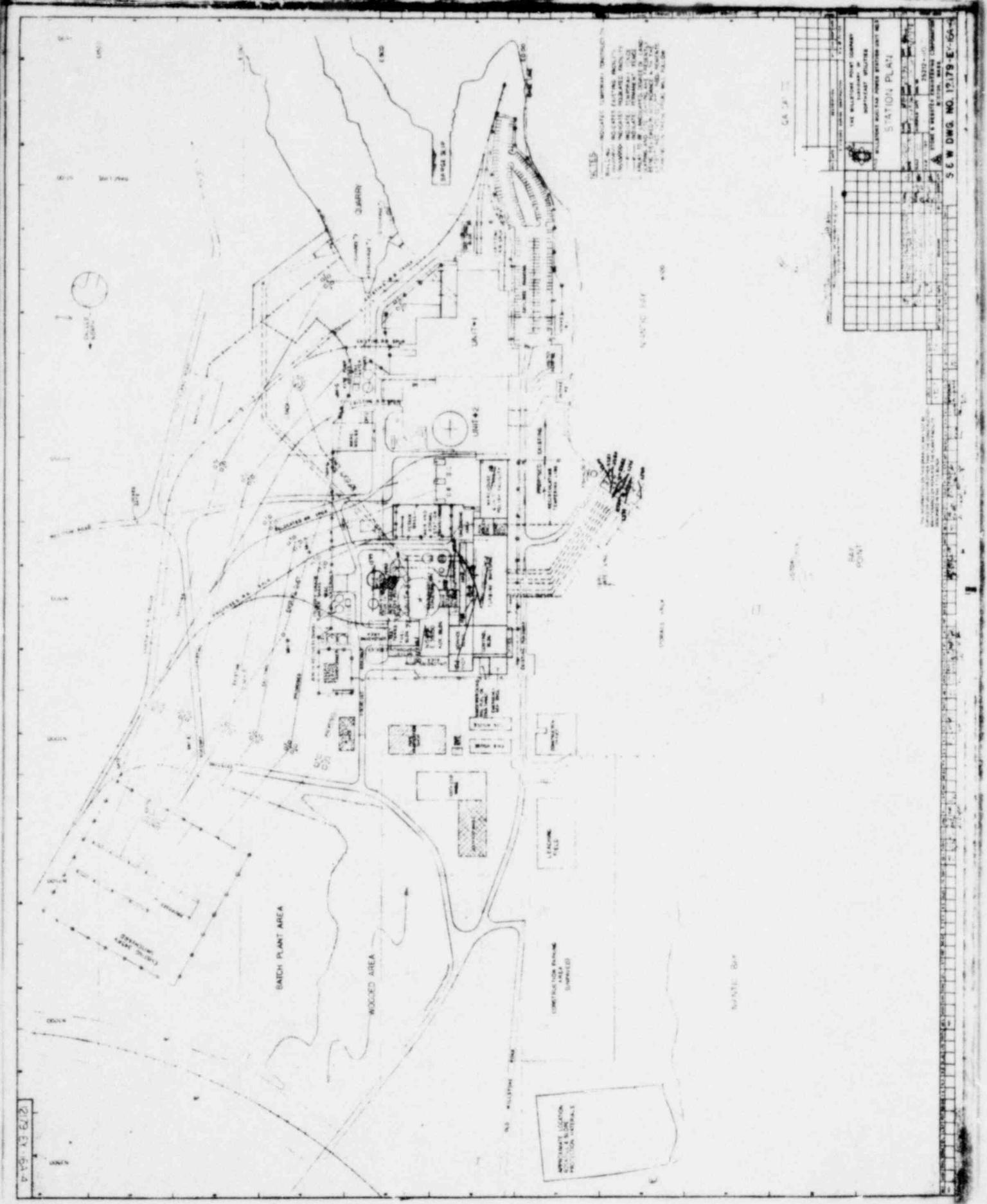
Fault	Attitude		Sense of Displacement in the Horizontal Plane	Amount of Apparent Displacement (ft)	Calculated Displacement (ft)	Remarks
	Strike	Dip				
1940	N43W	11W	Thrust to Northeast	0.1-0.15		Low angle reverse fault with extensive fractured rock and clay in fault zone. Shows evidence of hydrothermal alteration. 3.4 3.5 3.6 3.7 3.8
2339	N11E	85-90NW	Right Lateral	2-8		Highly fractured fault zone filled with gneiss and granite fragments rehealed in a siliceous matrix. Drusy quartz coats many surfaces throughout zone but there are only occasional pockets of clay gouge. 3.11 3.12 3.13 3.14 3.15 3.16 3.17 3.18 3.19 3.20
2330	N11E	90	Right Lateral	2-3		Splays from 2339 and rejoins with excavation. Has a similar filling to 2339. 3.22 3.23 3.24 3.25
2282	N5-25E	70-85SE	<i>I Unknown</i> Undeterminable	<i>I Unknown</i> Undeterminable		Displacement unknown due to pegmatite bordering entire east side of fault zone filled with fragments of granite and gneiss in a siliceous matrix. Occasional pockets of clay gouge. Heavy iron oxide staining throughout zone. 3.27 3.28 3.29 3.30 3.31 3.32 3.33 3.34 3.35 3.36
2295	N26E	90	Right Lateral	0-0.5		Splays from 2282 and rejoins within limit of excavation. Similar filling as 2282. 3.38 3.39 3.40 3.41
2250	N05E	85-90SE	<i>I Unknown</i> Undeterminable	<i>I Unknown</i> Undeterminable		The continuation of zone onto the southeastern excavation walls indicates 6 in ² of apparent reverse displacement. 3.43 3.44 3.45 3.46 3.47

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TABLE 2.5.3-1 (Cont)

<u>Fault</u>	<u>Attitude</u> <u>Strike</u> <u>Dip</u>	<u>Sense of</u> <u>Displacement in</u> <u>the Horizontal</u> <u>Plane</u>	<u>Amount of</u> <u>Apparent</u> <u>Displacement</u> <u>(ft)</u>	<u>Calculated</u> <u>Displacement</u> <u>(ft)</u>	<u>Remarks</u>
2204	N15-20W 85-90NE	Right Lateral	1-2		Very linear, thin splay from 2250 with severely weathered gneiss filling and some clay gouge.
				3.50	3.51 X
					3.52
					3.53
2251	N14E80-90NW	Left Lateral	0-0.3		Splays from 2204 with very thin siliceous coating on surfaces and some clay filling.
				3.57	
				3.58	
				3.59	
				3.60	
2380	N06W 54NE	Right Lateral	2		Fault zone extends along plane of foliation and is filled with gneiss fragments in a chlorite stained siliceous matrix.
				4.3	✓
				4.4	
				4.5	
				4.6	
				4.7	

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DESCRIPTION OF FAULTS IN MILLSTONE UNIT 3 -
PUMP HOUSE EXCAVATION

The excavation for the pump house structure of Millstone Nuclear Power Station - Unit 3 in November 1979 revealed several intersecting fault zones. The following is a summary of the field notes describing the eight most prominent zones. This does not include minor shear planes which branch from the eight faults and die out within the excavation. Results from the X-ray diffraction analysis and age dating of gouge samples taken from the fault zones will be included in the Final Safety Analysis Report.

2339 N11E/85-90 NW (Strike/Left)

Highly fractured fault zone, 3 in to 12 in wide and filled with moderately to severely weathered fragments of granite and gneiss, usually rehealed in a siliceous matrix. Cavities and fractures are typically coated with drusy quartz. Very thin clay gouge film coats many surfaces but is rarely in pockets.

Apparent right lateral displacement of granite dikes ranges between 2 ft (south of intersection with 2330) and 8 ft (north of intersection with 2330). Two sets of slickensides measured along the zone plunge to the southwest at 45 deg, indicating the final movement to be oblique-slip.

2330 N11E/Approx 90

Highly fractured fault zone which splays off of fault 2339 in the northwestern portion of the excavation and appears to join again just beyond the southern excavation limit. The composition of fault zone 2330 is similar to that of 2339.

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Apparent displacement along 2330 is 2 ft to 3 ft right lateral. The set of slickensides found along the fault zone plunges at '6 deg to the southwest, indicating at least the final movement to be oblique-slip.

2282 N5-25E/70-85 SE

Sinuuous, highly fractured zone, less than 1 ft wide and extending across the entire excavation. The major zone is filled with less than 6 in wide lenses of siliceous material (possibly cataclasite) with occasional fragments of granite or gneiss. Most of the associated fractures are coated or filled with drusy quartz. White clay gouge coats some surfaces and occurs only rarely in pockets.

The zone follows the western side of a granitic pegmatite intrusion, preventing any estimate of apparent displacement. However, similarities between 2282 and 2339 (size and composition of zone) indicate a similar amount of displacement. Slickensides on shear planes branching from 2282 indicate dip-slip movement.

2295 N26E/90

Sinuuous, fractured fault zone which splays off of 2282 at the southern side of the excavation and rejoins at the north wall. At the south end of 2295 the zone width and filling are similar to 2282. To the north, fault 2295 becomes a very thin shear zone with a siliceous filling and a very thin clay coating.

Apparent right lateral displacement along the zone ranges from 0 to 6 in, judging from offset of P-28, P-29, P-30, and P-31. A set of slickensides found on a branching joint surface indicates dip-slip movement.

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2250 N05E/85-90 SE

Slightly sinuous, highly fractured zone up to 1.5 ft wide. The major shear plane contains a filling up to 3 in thick of fragmented granite and gneiss surrounded by either clay gouge or drusy quartz. Along the southeast wall of the excavation, the zone changes into a set of closely to very closely spaced en echelon joints.

Due to the lack of regular gneiss-granite contacts on either side of the zone, the amount of displacement is undeterminable from the floor exposure. However, the extension of this zone onto the southeast rock face shows 6 in to 7 in of total reverse displacement (west side down) in a stepped arrangement along the en echelon joint set. Displacement was measured from offset of two 1 in wide, parallel and very planar granite dikes trending N70E/45 SE.

2204 N15-20W/85-90 NE

Very planar fault zone that splays to the southeast off of 2250. The zone is less than 3 in wide and filled with moderately to severely weathered gneiss, lenses of clay gouge, and angular fragments of gneiss in a siliceous matrix. Surfaces are occasionally coated with crystalline quartz. Joints branching off from 2204 every few feet have a clay filling and occasional crystalline quartz coatings.

Apparent right lateral displacement along 2204 is approximately 1 to 2 ft, measured from offset of two 1 in wide, extremely planar granite dikes trending N70E/45 SE. Slickensides along the fault are vague but appear to plunge at 36 deg to the northwest. Where pegmatite P-26 intersects 2204, an apparent right lateral

displacement of 0 to 6 in is indicated. P-26 roughly follows the trend of the foliation of N70W/57 NE.

2251 N14E/80-90 NW

Sinuuous shear plane that splays to the south off of 2204. Surfaces within zone are smooth to slightly rough with occasional crystalline quartz coating and clay filling. Shear plane branches into an en echelon joint set at the intersection with the southeast rock face.

Possible apparent left lateral displacement of several inches is indicated along the south end of 2251. Two separate sets of slickensides show plunges of 35 deg and 74 deg to the north, respectively.

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