GOVERNMENT ACCOUNTABILITY PROJECT
Institute for Policy Studies
1901 Que Street, N.W., Washington, D.C. 20009
(202) 234-9382

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re Midland GAP

response to this drafted 3/16/83

PRINCIPAL STAFF			
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DRPA		RC	
DRMSP			
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March 10, 1983

Mr. James E. Keppler
Director, Region III
Inspections and Enforcement
Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois

Dear Mr. Keppler:

On March 7, 1983 I attended a meeting with Mr. Darrell Eisenhut, Mr. Daryl Hodd, Mr. Tom Novack, Ms. Elinor Adamson of the Office of Nuclear Reactor Regulation (NRR), and Mr. Robert Warnick of your staff. Mr. Warnick confirmed a number of items of great concern to the Government Accountability Project (GAP) in regards to the Midland Nuclear Power Plant.

More specifically, Mr. Warnick confirmed that you and members of your staff have been meeting with management officials of Consumers Power Company ("Consumers") to iron out the details of the Construction Completion Plan (CCP). It was our understanding from your public statements at the February 8, 1983 public meeting that you intended to open up the CCP evaluation process for more public overview and comment. Yet it is clear the meetings that you and your staff have been having are on the very points that most need public input.

I am personnaly distressed that you have not responded to the overwhelming public concerns about the credibility of Consumers and the Bechtel Corporation. Surely you cannot expect the public to continue to trust the utility and its contractor to be able to allay public fears about their self- examination. This is the solution that the CCP is proposing.

GAP is not prepared to spend the next year haranguing over the methodological details of a third-party review that has not had the basic opportunity to review the condition of the plant. The inspection of the Diesel Genereator Building clearly indicates that Midland is not, and never has been, in the condition that the utility would have us all believe. It is inconceivable that the NRC could even consider a solution to the problems without first having a legitimate, independent, competent third party identify the actual condition of the plant.

Mr. Warnick identified a number of areas of discussion and debate surrounding the details of the CCP, these included such major items as whether there should be 100% inspection or sampling,

MAR 10 1983

what the reporting structure would be for the Quality Assurance/ Quality Control personnel within the teams, how the teams would be established, etc. These are items which betray the position that your Regional office has taken in the absence of either public input or analysis, or even the courtesy of a preliminary announcement.

If you intend to approve the Construction Completion Plan that draws its legitimacy from the third-party reviews (See CCP, Figure 3-1)of the plant --including the identification of the problems on site -- than please do so immediately.

If you intend to close the public input into the process of reviewing the acceptability and adequacy of the plan that Consumers has offered, than please make such an announcement.

If you have no intention of even considering having a third-party determine the extent of the problems on site, than you have effectively undermined the entire promise that you made to the residents of Midland.

Please answer the following questions concerning the steps that you have taken since the February 8, 1983 meeting concerning the CCP:

(1) What meetings (either personally or by conference call) have you, Mr. Robert Warnick, or members of the Midland Team had with management officials of Consumers Power Company regarding the CCP?

(2) For every meeting identified, what was the topic of discussions?

(3) What directives, policy statements, verbal approvals, tentative approvals, or strong indications have been given to Consumers as to the acceptability of the CCP?

(4) What approvals have been given by your staff in regards to any work on site going forward? (This excludes, of course the on-going soils work, and the steam turbine work.)

(5) What official holds - if any - have you placed on Consumers Power which would restrict its initiating work on the site when it saw fit?

(6) What plans does the staff have for its own determination of the "as-built" condition of the plant, either prior or subsequent to a third-party/Consumers review?

I look forward to your response within the next few days.

Sincerely,

Billie Pirner Garde

BILLIE PIRNER GARDE
Director, Citizens Clinic

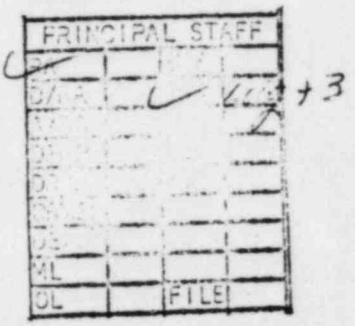
BPG/bl

BUG send to DMB 9/8/83

Consumers Power Company

Donald B Miller, Jr
Site Manager
Midland Project

Midland Project: PO Box 1963, Midland, MI 48640 • (517) 631-8650



September 1, 1983

Mr J J Harrison
Midland Project Section
U S Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

MIDLAND ENERGY CENTER GWO 7020
REMEDIAL SOILS WORK AUTHORIZATION
File: 0485.16 UFI: 42*05*22*04 Serial: CSC-6862
12*32

We are enclosing the proposed list of work in accordance with the "NRC and CPCo Work Authorization Procedure" for the period between September 1, 1983, and September 30, 1983. Please review this work list and authorize the specific work items as established in the procedure.

Also enclosed is a Supplemental Work Activity List for October, 1983. Your review, comments and authorization of the specific work items as in accordance with the procedure are similarly requested.

DBM/AEB/klm

Attachments

SEP 8 1983

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Consumers Power Company
Midland Plant Units 1 & 2

Attachment to Serial CSC-6862

WORK ACTIVITY LIST FOR THE PERIOD BETWEEN SEPTEMBER 1, 1983 and SEPTEMBER 30, 1983
DEVELOPED IN COMPLIANCE WITH ASLB ORDER OF APRIL 30, 1982

NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
		GENERAL	
		QUALITY PROGRAM	
	102351100	Approval of MPQP-2, Rev 1	A (10/22/82)
	102351120	Approval of MPQP-1, Rev 6	A (6/20/83)
		AUXILIARY BUILDING & FIVP UNDERPINNING PROGRAM	
		WEST FIVP	
	102150010	Install Anchor Bolts & Rods (includes hardness test on rods, drill concrete & steel and tensioning)	1 (8/12/82) A (8/13/82)
		EAST FIVP	
	112150010	Install Anchor Bolts & Rods (includes hardness tests on rods, drill concrete & steel, and tension)	1 (8/12/82) A (8/13/82)
	162550010	WEST TURBINE/AUX BUILDING PIPE TUNNEL MODIFICATION Install Platform at El 600' (includes installation of Pipe Tunnel Reinforcement, cutting of opening, Modification of Handrails and Ladder and Protection of Existing Piping)	1 (4/5/83) A (4/20/83)
	162550100	Exploratory probe for UAT (West)	A (8/04/83)
	162550012	Pregrout from UAT (West)	A (8/04/83)

WORK ACTIVITY LIST FOR THE PERIOD BETWEEN SEPTEMBER 1, 1983 and SEPTEMBER 30, 1983
DEVELOPED IN COMPLIANCE WITH ASLB ORDER OF APRIL 30, 1982

NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
	152550010	EAST TURBINE/AUX BUILDING PIPE TUNNEL MODIFICATION Install Platform at El 600' (includes installation of Pipe Tunnel Reinforcement, cutting of opening, Modification of Handrails and Ladder and Protection of Existing Piping)	1 (4/5/83) A (4/20/83)
	152550100	Exploratory probing for UAT (East)	A(8/04/83)
	152550012	Pregrout from UAT (East)	A(8/04/83)
		BUILDING MONITORING	
	136050043	Maintain Instrument System	3 (8/12/82) A (8/12/82)
	132550027	Install strain gauges and terminate cables (includes testing and calibration)	A(07/28/83)
	132550050	Install, wire conduit and raceway from pier to data room for Pier Instrumentation	2(12/13/82) A(12/13/82)
	165052021	Terminate Cables in Data Room & Terminal Boxes & Pier Instrumentation	A (3/10/83)
		GENERAL TEMPORARY DEWATERING	
	125150050	Continue Monitoring Utility Protection Pits (4)	3 (8/12/82) A (8/12/82)
	115150020	Continue Operation of Freeze System & Wells	3 (8/12/82) A (8/12/82)
	522550025	Excavate, Repair and Backfill Piezometer MP-2	1 (4/5/83)
	522550020	Repair Six (6) Existing Observation Wells (WB-1, WP-2, COE-10, PD-18, W-2, PD-38)	1 (4/5/83)
	125150051	Install Clay to Below Duct Bank (pit 4)	1 (8/12/82)

WORK ACTIVITY LIST FOR THE PERIOD BETWEEN SEPTEMBER 1, 1983 and SEPTEMBER 30, 1983
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NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
	125150052	Repair Ductbank (Pit 4) (includes excavate, drift, repair and backfill)	1 (8/25/82)
	115150026	Remove 36" Casing and Backfill 42" Hole	1 (9/17/82)
	115150025	Clean out and backfill abandoned ejector holes (ME26A, ME28A and ME54)	R
	102550135	Install piezometers BB1 & BB2 in Auxiliary Building Control Tower	A(07/28/83)
		CRACK MAPPING (includes scaffolding platforms, ladders and extra-ordinary clean up)	
	102250200	EPA (East & West)	3 (8/12/82) A (8/12/82)
	102250105	FIVP (East & West)	3 (8/12/82) A (8/12/82)
	102250100	Control Tower & Remainder of Aux Bldg	3 (8/12/82) A (8/12/82)
	165054010	PIER 12W Install & Load Pier $12W^3$	1 (8/12/82) A (12/9/82)
	165054015	PIER 11W Install & Load Pier $11W^3$ (includes install bituminous plywood forms)	1 (8/25/82) A (2/22/83)
	165054005	PIER 9W Install & Load Pier $9W^3$	1 (9/17/82) A (2/24/83)

WORK ACTIVITY LIST FOR THE PERIOD BETWEEN SEPTEMBER 1, 1983 and SEPTEMBER 30, 1983
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NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
		PIER 12E	
	155054010	Install & Load Pier 12E[3]	1 (8/12/82) A (12/9/82)
		PIER 11E	
	155054015	Install & Load Pier 11E[3]	1 (8/[illegible]/82) A (2/22/83)
		PIER 9E	
	155054005	Install & Load Pier 9E[3]	1 (9/17/82) A (2/24/83)
		PIER 8E	
	155054020	Install & Load Pier 8E[3]	1 (9/17/82) A (5/3/83)
		GRILLAGE STRUCTURE AT PIER 8E	
	155055010	Install & Load Grillage Structure at Pier 8E	1 (9/17/82) A (6/20/83)
		PIER 8W	
	165054020	Install & Load Pier 8W[3]	1 (9/17/82) A (5/3/83)
		GRILLAGE STRUCTURE AT PIER 8W	
	165055010	Install & Load Grillage Structure at Pier 8W	1 (9/17/82) A (6/20/83)
		EXCAVATION ZONES	
	165056375	Excavate/Lag Zone Z2	A (5/27/83)
	155056375	Excavate/Lag Zone Y2	A (5/27/83)
		PIER W10	
	165054030	Install & Load Pier 10W[3]	1 (4/5/83) A (5/3/83)
		PIER E10	
	155054030	Install & Load Pier 10E[3]	1 (4/5/83) A (5/3/83)

Consumers Power Company
Midland Plant Units 1 & 2

Attachment to Serial CSC-6862

WORK ACTIVITY LIST FOR THE PERIOD BETWEEN SEPTEMBER 1, 1983 and SEPTEMBER 30, 1983
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NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
		SLAB Modification at El 659.0'	
	102250208	Survey/Layout for Engineering Review in Preparation for Slab Fix @ El 659	3 (4/5/83) A (4/5/83)
		PIER KC2	
	165054315	Install & Load Pier KC2[3]	1 (9/17/82) A (4/22/83)
		PIER KC11	
	155054315	Install & Load Pier KC11[3]	1 (9/17/82) A (4/22/83)
		PIER KC3	
	165053310	Excavate Pier KC3[2]	A (07/28/83)
	165054305	Install & Load KC3[3]	A (07/28/83)
		PIER KC10	
	155053310	Excavate Pier KC10[2]	A (07/28/83)
	155054305	Install & Load KC10[3]	A (07/28/83)
		PIER W14	
	165052057	Drift From West Access Shaft to Pier W14[1] (includes Access Pit)	A (08/29/83)
	165053055	Excavate Pier W14[2]	A (08/29/83)
	165054050	Install Pier W14	A (08/29/83)

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WORK ACTIVITY LIST FOR THE PERIOD BETWEEN SEPTEMBER 1, 1983 and SEPTEMBER 30, 1983
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NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
		PIER E14	
	155052057	Drift from East Access Shaft to Pier E14[1] (includes Access Pit)	A (08/29/83)
	155053055	Excavate Pier E14[2]	A (08/29/83)
	155054050	Install Pier E14	A (08/29/83)
		LEVEL C WALES	
	165055305	Install Level C Wales, West Side	A (08/29/83)
	155055305	Install Level C Wales, East Side	A (08/29/83)
		PIER CT12	
	155052035	Drift to CT12 from UAT[1]	
	155053050	Excavate Pier CT12[2]	
	155054045	Install & Load Pier CT12[3]	
		PIER CT1	
	165052035	Drift to CT1 from UAT[1]	
	165053050	Excavate Pier CT1[2]	
	165054045	Install & Load Pier CT1[3]	

Consumers Power Company
Midland Plant Units 1 & 2

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NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION	
		BRACE/STRUT E10 & E11		
*	155055320	Install Brace/Strut E10 & E11		
		BRACE/STRUT W10 & W11		
*	165055320	Install Brace/Strut W10 & W11		
		LONG DRIFTS		
	155052030	Drift to KC3 from KC2[1]		A (07/28/83)
	165052030	Drift to KC10 from KC11[1]		A (07/28/83)
	155054515	Construct concrete invert and layback soil KC2 to KC3	1 (7/5/83)	
	165054515	Construct concrete invert and layback soil KC11 to KC10	1 (7/5/83)	
		SERVICE WATER PUMP STRUCTURE UNDERPINNING PROGRAM		
		POST TENSIONING SYSTEM		
	202555170	Post Tensioning Tendon inspection & maintenance	3(12/7/82)	A (12/7/82)
		DEWATERING		
	207050605	Install Remaining Ejector Wells		A (6/23/83)
	207050385	Core Drill SWPS Slab for Ejector Wells		A (3/17/83)
	207050386	Core Drill CWIS Slab for Ejector Wells	1(11/1/82)	A (3/17/83)
	207050748	Probe for Deep Utilities Outside El 610 Excavation Limits (Ref Dwg C-2031)	1 (4/5/83)	A (5/27/83)
	207050380	Core drill SWPS and CWIS slabs for Piezometers		A (4/13/83)

WORK ACTIVITY LIST FOR THE PERIOD BETWEEN SEPTEMBER 1, 1983 and SEPTEMBER 30, 1983
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NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
	207050600	Install Piezometers	A (6/23/83)
	207050635	Install Dewatering Discharge System (including headers, tank, pumps and electrical)	2 (9/17/82) A (6/23/83)
	207050387	Convert 7 Wells used on 72" pipe repair to support SWPS dewatering. (Includes install new ejectors, temporary headers, operate, & maintain)	1(11/1/82) A (2/11/83)
	203150165	Fill SWPS Chambers (Bays) Fill SWPS Chambers with Water to El 622 (±5')	
	202550164	Modify Pipe Supports SWPS - Modify pipe supports to allow for design load (30" OHBC 34, 20 & 16)	A (5/27/83)
	207050335	ACCESS SHAFT & EXCAVATION Install Soldier Piles	1 (8/12/82) A (5/27/83)
	206050105	BUILDING MONITORING Crack Map SWPS	1 (9/17/82) A (3/10/83)
	206050101	Install Permanent Benchmark Covers	1 (9/17/82) A (4/20/83)
	206050104	Baseline, Operate, and Maintain Instrument System	R
	852450105	DUCTBANK PENETRATION SWPS - Provide Ducktbank Penetration in SWPS Wall and install pull box.	

WORK ACTIVITY LIST FOR THE PERIOD BETWEEN SEPTEMBER 1, 1983 and SEPTEMBER 30, 1983
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NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
		BORATED WATER STORAGE TANK FOUNDATION & TANK REPAIR PROGRAM	
		UNIT 1 TANK	
	312150005	Drill and Grout Shear Connectors	2(12/13/82) A (4/20/83)
	312150007	Prepare concrete surfaces, drill holes & remove concrete for rebar.	A (4/20/83)
	312150011	Construct New Ring Beam (set forms & place rebar, pour concrete)	1 (8/12/82) A (7/8/83)
	312550019	Reinstall Electrical Ductbank	2 (9/17/82) A (4/6/83)
	312550018	Reinstall Piping, Pipe Hangers and Electrical Facilities	A (3/17/83)
		UNIT 2 TANK	
	322150005	Drill and Grout Shear Connectors	2(12/13/82) A (4/20/83)
	322150007	Prepare concrete surfaces, drill holes & remove concrete for rebar	A (4/20/83)
	322150011	Construct New Ring Beam (set forms & place rebar, pour concrete)	1 (8/12/82) A (7/8/83)
	322550019	Reinstall Electrical Duct Bank	2 (9/17/82) A (4/6/83)
	322550018	Reinstall Piping, Pipe Hangers and Electrical Facilities	A (3/17/83)
	322150212	Repair Tank Weld Defect	R

WORK ACTIVITY LIST FOR THE PERIOD BETWEEN SEPTEMBER 1, 1983 and SEPTEMBER 30, 1983
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NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
		UNDERGROUND PIPE REPLACEMENT, REBEDDING, AND MONITORING PROGRAM	
		SHALLOW PROBING FOR PHASE II	
	407050400	Shallow probing for Phase II (Ref DWG C-2031)	A (5/27/83)
		TRAIN A OF SERVICE WATER PIPE REPLACEMENT[4]	
	402550520	Install new pipe & expansion coupling	1 (8/25/82) A (5/27/83)
	402550515	Hydro Test new pipe	A (5/27/83)
	402550507	Perform Profiling & Ovality Check on New Piping	A (5/27/83)
	402550525	Temporary Backfill New Pipe	1 (4/5/83)
		CONSTRUCTION WORK IN SOIL MATERIAL PROGRAMS	
		PERMANENT INTRUSION DETECTION SYSTEM	
	732050002	Install Wire (incl conduit)	3 (8/25/82) A (8/25/82)
	732050003	Install Fence (incl fence posts & concrete strip)	3 (8/25/82) A (8/25/82)
	732050004	Install Grounding	3 (9/17/82) A (9/17/82)
		OBS-4 Repair	
	522550018	Dutch Cone Soil Testing in Vicinity of OBS-4 for exploratory purposes	A (07/28/83)

WORK ACTIVITY LIST FOR THE PERIOD BETWEEN SEPTEMBER 1, 1983 and SEPTEMBER 30, 1983
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NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
		Acid-Caustic Unloading Station	
	822550001	Excavate, install and backfill drainline and slab for Acid-caustic unloading station at East end of Turbine Building	1 (11/1/82) A (4/20/83)
		EMERGENCY PERSONNEL LOCKS - UNIT 2	
	792550005	Excavate, rebar, pour concrete and backfill Airlock Structure	1 (9/17/82)
		SIT/ILRT TEST FACILITIES	
	862450105	Exploratory Excavation at SIT/ILRT Duct Bank	A(5/27/83)
		PERMANENT DEWATERING PROGRAM	
	522150005	Install Remaining Wells	1 (9/17/82)
	522550016	Install electrical equipment & conduit	1 (9/17/82)
**	522550021	Excavate, install and backfill header piping, electrical conduit, and pumps (including equipment slabs and metering pits)	1 (9/17/82)
**	522550026	Assemble and wire pump control panels	
		DIESEL FUEL SUPPLY LINES	
	722050001	Install missle shielding	1 (8/25/82)
	722050002	Excavate, remove, reinstall and backfill DFO supply lines	1 (11/1/82)

WORK ACTIVITY LIST FOR THE PERIOD BETWEEN SEPTEMBER 1, 1983 and SEPTEMBER 30, 1983
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NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
		DIKE MAINTENANCE	
	812550010	Normal dike maintenance in Q areas	A (5/27/83)
		CONTROL ROOM PRESSURIZATION TANK SETTLEMENT MARKERS	
	932450100	Excavate for, install and backfill Control Room pressurization tank settlement markers	
		MISCELLANEOUS	
	942450200	Remove (excavation) temporary uncontrolled fill located in Q areas (DWG C-45Q) as identified on NCRs and the OGSE action item logs, and backfill per Spec C-211Q	1 (7/5/83)
	942450300	Excavate and backfill trench for ground cable east of Tech Support Center.	3 (7/15/83) A (7/15/83)
		CATHODIC PROTECTION	
	752050001	Drill and replace annodes (as necessary)	1 (8/25/82)
	752050002	Drill and install new annodes	1 (11/1/82)

Consumers Power Company
Midland Plant Units 1 & 2

Attachment to Serial CSC-6862

SUPPLEMENTAL WORK ACTIVITY LIST FOR THE PERIOD BETWEEN OCTOBER 1, 1983 AND OCTOBER 31, 1983
DEVELOPED IN COMPLIANCE WITH ASLB ORDER OF APRIL 30, 1982

NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
		AUXILIARY BUILDING & FIVP UNDERPINNING PROGRAM	
		SUPPORT BRACKET	
	152555010	Install Temporary Support Bracket at E1	
	162555010	Install Temporary Support Bracket at W1	
		PIER E13	
	155053040	Excavate Pier E13[2]	A (08/29/83)
	155054035	Install Pier E13	A (08/29/83)
		PIER W13	
	165053040	Excavate Pier W13[2]	A (08/29/83)
	165054035	Install Pier W13	A (08/29/83)
		DOWELS AT FIVP	
	155050325	Install dowels at east FIVP	
	165050325	Install dowels at west FIVP	
		PIER KC4	
	155052032	Finger Drift to KC4[1]	
	155053315	Excavate Pier KC4[2]	
	155054310	Install & Load Pier KC4[3]	

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SUPPLEMENTAL WORK ACTIVITY LIST FOR THE PERIOD BETWEEN OCTOBER 1, 1983 AND OCTOBER 31, 1983
DEVELOPED IN COMPLIANCE WITH ASLB ORDER OF APRIL 30, 1982

NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
		PIER KC9	
	165052032	Finger Drift to KC9[1]	
	165053315	Excavate Pier KC9[2]	
	165054310	Install & Load Pier KC9[3]	
		LONG DRIFTS	
**	155052320	Drift from KC3 to 13ft East of KC4[1]	
**	165052320	Drift from KC10 to 9ft West of KC9[1]	
*	155054510	Construct invert KC3 to KC4	
*	165054510	Construct invert KC10 to KC9	
		PIER CT3	
*	165052080	Drift To CT3 (pregrout)	
		PIER CT10	
*	155052080	Drift to CT10 (pregrout)	
		FINGER DRIFT ON COL 9 to J	
*	155052060	Finger drift and demo mudmat on Col 9 to J	

SUPPLEMENTAL WORK ACTIVITY LIST FOR THE PERIOD BETWEEN OCTOBER 1, 1983 AND OCTOBER 31, 1983
DEVELOPED IN COMPLIANCE WITH ASLB ORDER OF APRIL 30, 1982

NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
		FINGER DRIFT ON COL 4 to J	
*	165052060	Finger drift and demo mudmat on Col 4 to J	
		UNDERGROUND PIPE REPLACEMENT, REBEDDING, AND MONITORING PROGRAM	
		TRAIN B OF SERVICE WATER PIPE REPLACEMENT[4]	
	402550446	Excavate Existing Pipe	1 (8/12/82)
	402550550	Remove Existing Pipe	R
	402550560	Install new pipe & expansion coupling	R
	402550561	Hydro Test new pipe	R
	402550508	Perform Profiling & Ovality Check on New Piping	R
	402550562	Temporary Backfill New Pipe	1 (4/5/83)
		SERVICE WATER PUMP STRUCTURE UNDERPINNING PROGRAM	
		EXCAVATION	
	207050781	Excavate, lag, brace and install wales and struts in upper east section of SWPS access shaft (soldier piles 14 thru 30 - maximum excavation to EL 618'-3" excluding localized excavation at pipe supports).[5]	

SUPPLEMENTAL WORK ACTIVITY LIST FOR THE PERIOD BETWEEN OCTOBER 1, 1983 AND OCTOBER 31, 1983
DEVELOPED IN COMPLIANCE WITH ASLB ORDER OF APRIL 30, 1982

NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
	207050782	Excavate, lag, brace and install wales and struts in upper west section of SWPS access shaft (soldier Piles 1 thru 14 - maximum excavation to EL 624'-9" excluding localized excavation at pipe supports.)[5]	
	207050783	Excavate lag, brace and install wales and struts, pour and cure concrete mudmat in lower east section of SWPS access shaft (soldier piles 15 thru 30 - maximum excavation to EL 618'±6" excluding localized excavation.)[5]	1 (7/5/83)
	207050784	Excavate, lag, brace and install wales and struts, pour and cure concrete mudmat in lower west section of SWPS access shaft (soldier piles 1 thru 14 - maximum excavation to EL 618'±6" excluding localized excavation.)[5]	1 (7/5/83)
**	202550163	Remove abandoned fire protection pipeline (as necessary)	I (11/1/82) A (5/27/83)
		DEWATERING SYSTEM	
	207050620	Activate, Operate and Maintain Dewatering System	R
		BORATED WATER STORAGE TANK FOUNDATION AND TANK REPAIR PROGRAM	
	312150015	Relevel Tank-Unit 1	1 (9/17/82)
	312550100	Install Instruments (includes testing and calibration)	1 (11/1/82)
	322550100	Install Instruments (includes testing and calibration)	1 (11/1/82)

SUPPLEMENTAL WORK ACTIVITY LIST FOR THE PERIOD BETWEEN OCTOBER 1, 1983 AND OCTOBER 31, 1983
DEVELOPED IN COMPLIANCE WITH ASLB ORDER OF APRIL 30, 1982

NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
		CONSTRUCTION WORK IN SOIL MATERIAL PROGRAMS	
		PERMANENT DEWATERING	
	522550014	Excavate Headers & Metering Pits, Install Header and Level Monitoring System, Install Pumps, Timers and Backfill	
		CONTAINMENT TENDON ACCESS VENT HVAC	
	802550010	Excavate for, Install and Backfill Electrical Duct Bank and Equipment Pad for the Unit 1 HVAC Fan	1 (9/17/82)
	802550020	Excavate for, Install and Backfill Electrical Duct Bank and Equipment Pad for the Unit 2 HVAC Fan	1 (9/17/82)
		NITROGEN TANK INSTALLATION	
	782550005	Excavate for, install and backfill electrical duct bank	1 (9/17/82)
	782550010	Excavate for, install and backfill piping	1 (9/17/82)
	782550015	Excavate for, install and backfill concrete pad	1 (9/17/82)
	782550020	Excavate for, install and backfill nitrogen tanks and associated concrete structures	1 (9/17/82)

FOOTNOTES

[1] Drift Activity normally includes
1. fabricate steel sets
2. excavate
3. install steel sets (Hilti bolts as necessary)
4. remove concrete (as necessary)
5. localized dewatering (as necessary)
6. install wood lagging
7. place mudmat
8. stabilize soil (as necessary)
9. brace and/or rebrace

[2] Excavate Pier activity normally includes
1. excavate
2. concrete removal (as necessary)
3. dewatering (as necessary)
4. fabricate steel lagging
5. install steel lagging
6. auger bottom of pit to determine hydrostatic water pressure & plug (piers 10 & 12 E&W)
7. place mudmat
8. stabilize soil (as necessary)

[3] Install & load Pier activity normally includes
1. fab & install embeds
2. fab & install reinforcing steel
3. install telltales
4. install Carlson meters (pier 11 E&W)
5. place concrete
6. fab & install leveling & bearing plates, jackstands
7. install jacks
8. transfer load.
*9. monitor and adjust pier jacks after load transfer

[4] These activities have been broken down into Train A and Train B. They were previously combined under the title "Train A & B of Service Water Pipe Replacement."

[5] Excavate Access Shaft Activity Normally Includes:
1. excavate
2. fabricate and install steel lagging
3. fabricate and install structural steel supports and bracing
4. place mudmat
5. stabilize soil (as necessary)
6. localized dewatering (as necessary)
7. support and protect utilities

NOTES

A single asterisk (*) in left hand column indicates the work activity is a new item.

A double asterisk (**) in left hand column indicates the work activity description has been revised.

Designation 1 in the right hand column indicates additional information is required by NRC Region III on this critical activity.

Designation 2 in the right hand column indicates no additional information is required by NRC Region III on this critical activity.

Designation 3 in the right hand column indicates that the activity is not critical and work can proceed.

The date shown after the designation corresponds to the date of the NRC letter that provided the designation.

An "A" following the designation indicates that Region III has provided approval to proceed with the activity. The date following the "A" corresponds with the date of the NRC letter that provides authorization to proceed with the work activity.

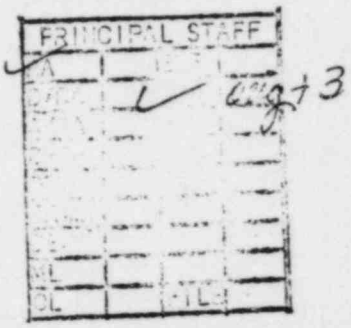
A "R" in the right hand column indicates that previous designation or approval has been recinded because of a significant revision to the work activity or 90 days has elapsed or is expected to elapse since the work was authorized without the work being initiated.

Orig. sent to DMB 9/8/83

Consumers Power Company

Donald B Miller, Jr
Site Manager
Midland Project

Midland Project: PO Box 1963, Midland, MI 48640 • (517) 631-8650



August 31, 1983

Mr J J Harrison
Midland Project Section
U S Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

MIDLAND ENERGY CENTER GWO 7020
REMEDIAL SOILS WORK AUTHORIZATION
File: 0485.16 UFI: 42*05*22*04 Serial: CSC-6868
12*32

We have completed our review of the documents for the activity listed below. Based on our review, we concluded that we are ready to start the work:

522550026 Assembly and Wire Pump Control Panels

According to the NRC/CPCo Work Authorization Procedure, we request authorization for the above activity.

DBM/DWP/klm

SEP 8 1983

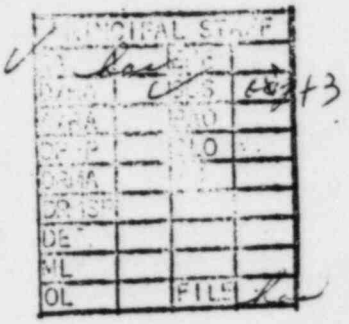
8309130012

sent to DMB 8/31/83

Consumers Power Company

J A Mooney
Executive Manager
Midland Project Office

General Offices: 1945 West Parnall Road, Jackson, MI 49201 • (517) 788-0774



August 25, 1983

Mr J J Harrison
Midland Project Section
U S Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

MIDLAND ENERGY CENTER GWO 7020
REMEDIAL SOILS WORK AUTHORIZATION
File: 0485.16 UFI: 42*05*22≠04 Serial: CSC- 6863
12*32

A number of activity authorizations have passed the 90 day expiration limit. In accordance with the Work Authorization Procedure, we request re-authorization of the following activities:

165052057	Drift From West Access Shaft to Pier W14
165053055	Excavate Pier W14
165054050	Install Pier W14
155052057	Drift From East Access Shaft to Pier E14
155053055	Excavate Pier E14
155054050	Install Pier E14
155053040	Excavate Pier E13
155054035	Install Pier E13
165053040	Excavate Pier W13
165053035	Install Pier W13
165055305	Install Level C Wales, West Side
155055305	Install Level C Wales, East Side

JAMooney

JAM/RMW/klm

AUG 31 1983

8309020335

sent to DMB 8/25/83

Consumers Power Company

Donald B Miller, Jr
Site Manager
Midland Project

Midland Project: PO Box 1963, Midland, MI 48640 • (517) 631-8650

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D/RA		SCS	
A/RA		PAO	
DPRP		SLO	
DRMA		RC	
DRMSP			
DE			
ML			
RL		FILE	

+3

August 22, 1983

Mr J J Harrison
Midland Project Section
U S Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

MIDLAND ENERGY CENTER GWC 7020
REMEDIAL SOILS WORK AUTHORIZATION
File: 0485.16 UFI: 42*05*22*04 Serial: CSC-6860
12*32

Per our telephone conversation between Bruce Peck and Glenn Murray of our office and Dr. Landsman of NRC Region III on August 19, 1983, we are requesting the re-authorization of the following activity:

206050104 Baseline, Operate, and Maintain Instrument System (SWPS)

The baseline was started on July 20, 1983 and the collecting of data is continuing.

DRM/GMM/klm

8308300515

AUG 25 1983

sent to DMB 8/25/83

Consumers Power Company

Donald B Miller, Jr
Site Manager
Midland Project

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DRSP		RC	
DRSP			
DE			
OL		FILE	

August 22, 1983

Mr J J Harrison
Midland Project Section
U S Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

MIDLAND ENERGY CENTER GWO 7020
REMEDIAL SOILS WORK AUTHORIZATION
File: 0485.16 UFI: 42*05*22*04 Serial: CSC-6858
12*32

We have completed our review of the documents for the activity listed below. Based on our review, we concluded that we are ready to start the work:

115150026 Remove 36" Casing and Backfill 42" Hole

According to the NRC/CPCo Work Authorization Procedure, we request authorization for the above activity.

DBM/DWP/klm

8308300679

AUG 25 1983

xmt to DMB 8/24/83

Consumers Power Company

General Offices: 1945 West Parnall Road, Jackson, MI 49201 • (517) 788-0774

J A Mooney
Executive Manager
Midland Project Office

PRINCIPAL STAFF			
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DPRP		SLO	
DRMA		RC	
DRMSP			
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August 17, 1983

Mr J J Harrison
Midland Project Section
U S Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

MIDLAND ENERGY CENTER GWO 7020
REMEDIAL SOILS WORK AUTHORIZATION
File: 0485.16 UFI: 42*05*22*04 Serial: CSC-6855
70*01

The following items were discussed in 8/15/83 and 8/16/83 telecons between Dr. Ross Landsman of NRC Region III and R. Wheeler, R. Wieland, and D. Puhalla of CPCo.

1. Four (4) additional wells will be added to the Service Water Pump Structure Dewatering System (Reference Activity Number 207050605).

2. The design for pipe hangers on lines 30" OHBC 34, 20, and 16 in the Service Water Pump Structure has been revised (Reference Activity Number 202550164).

3. An FCR will be written to allow the installation of level C wales in the Auxiliary Building Access Shaft to proceed prior to completion of Zones Z-2 and Y-2 excavation.

Dr. Landsman concurred that these three items constitute minor changes to the previously approved activities.

JAMooney

JAM/RHW/klm

8308290322

AUG 22 1983

Consumers Power Company

General Offices: 1945 West Parnall Road, Jackson, MI 49201 • (517) 788-0774

J A Mooney
Executive Manager
Midland Project Office

PRINCIPAL STAFF

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DPPP		SLO	
DRMA		RC	
DRMSP			
DE			
PAL			
OL		FILE	Kane

orig +

August 12, 1983

Mr J J Harrison
Midland Project Section
U S Nuclear Regualtory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

MIDLAND ENERGY CENTER GWO 7020
REMEDIAL SOILS WORK AUTHORIZATION
File: 0485.16 UFI: 42*05*22*04 Serial: CSC-6850

We have completed our review of the documents for the activity listed below. Based on our review, we submit the following for work authorization:

GENERAL TEMPORARY DEWATERING

522550020 Repair Six (6) Existing Observation Wells (WB-1, WP-2, COE-10, PD-18, W-2, PD-38)

Note: There were duplicate numbers, including the above number, in last month's Work Activities List (CSC-6798). The following changes will be made to correct the duplication:

522550020 Excavate, Install and Backfill Header Piping, Electrical Conduit, and Pumps (Includes Equipment Slabs and Metering Pits. [See Page 11]).
This number will be changed to be 522550021.

522550025 Assembly and Wire Pump Control Panels.
This number will be changed to be 522550026.

These two activity number changes will be made on the next issue of the activity list.

JAMooney

JAM/AEB/klm

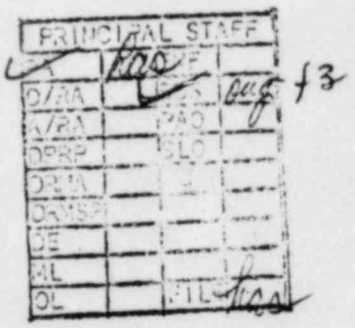
AUG 1 8 1983

8308220234

Consumers Power Company

General Offices: 1945 West Parnall Road, Jackson, MI 49201 • (517) 788-0774

J A Mooney
Executive Manager
Midland Project Office



July 28, 1983

Mr J J Harrison
MIdland Project Section
U S Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

MIDLAND ENERGY CENTER GWO 7020
REMEDIAL SOILS WORK AUTHORIZATION
File: 0485.16 UFI: 42*05*22*04 Serial: CSC-6798
12*32

We are enclosing the proposed list of work accordance with the "NRC and CPCo Work Authorization Procedure" for the period between August 1, 1983, and August 31, 1983. Please review this work list and authorize the specific work items as established in the procedure.

Also enclosed is a Supplemental Work Activity List for September, 1983. Your review, comments and authorization of the specific work items as in accordance with the procedure are similarly requested.

JAMooney

JAM/AEB/klm

Attachment

AUG 04 1983

OC0783-0005B-CN01

8308100115

Consumers Power Company
Midland Plant Units 1 & 2

Attachment to Serial CSC-6798

WORK ACTIVITY LIST FOR THE PERIOD BETWEEN AUGUST 1, 1983 and AUGUST 31, 1983
DEVELOPED IN COMPLIANCE WITH ASLB ORDER OF APRIL 30, 1982

NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
		GENERAL	
		QUALITY PROGRAM	
	102351100	Approval of MPQP-2, Rev 1	A(10/22/82)
	102351120	Approval of MPQP-1, Rev 6	A(6/20/83)
		AUXILIARY BUILDING & FIVP UNDERPINNING PROGRAM	
		WEST FIVP	
	102150010	Install Anchor Bolts & Rods (includes hardness test on rods, drill concrete & steel and tensioning)	1 (8/12/82) A (8/13/82)
		EAST FIVP	
	112150010	Install Anchor Bolts & Rods (includes hardness tests on rods, drill concrete & steel, and tension)	1 (8/12/82) A (8/13/82)
	162550010	WEST TURBINE/AUX BUILDING PIPE TUNNEL MODIFICATION Install Platform at El 600' (includes installation of Pipe Tunnel Reinforcement, cutting of opening, Modification of Handrails and Ladder and Protection of Existing Piping)	1 (4/5/83) A (4/20/83)
*	162550100	Exploratory probe for UAT (West)	
	162550012	Pregrout from UAT (West)	

Consumers Power Company
Midland Plant Units 1 & 2

Attachment to Serial CSC-6798

WORK ACTIVITY LIST FOR THE PERIOD BETWEEN AUGUST 1, 1983 and AUGUST 31, 1983
DEVELOPED IN COMPLIANCE WITH ASLB ORDER OF APRIL 30, 1982

NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
	152550010	EAST TURBINE/AUX BUILDING PIPE TUNNEL MODIFICATION Install Platform at El 600' (includes installation of Pipe Tunnel Reinforcement, cutting of opening, Modification of Handrails and Ladder and Protection of Existing Piping)	1 (4/5/83) A (4/20/83)
*	152550100	Exploratory probing for UAT (East)	
	152550012	Pregrout from UAT (East)	
		BUILDING MONITORING	
	136050043	Maintain Instrument System	3 (8/12/82) A (8/12/82)
	132550027	Install strain gauges and terminate cables (includes testing and calibration)	A(07/28/83)
	132550050	Install, wire conduit and raceway from pier to data room for Pier Instrumentation	2(12/13/82) A(12/13/82)
	165052021	Terminate Cables in Data Room & Terminal Boxes & Pier Instrumentation	A (3/10/83)
		GENERAL TEMPORARY DEWATERING	
	125150050	Continue Monitoring Utility Protection Pits (4)	3 (8/12/82) A (8/12/82)
	115150020	Continue Operation of Freeze System & Wells	3 (8/12/82) A (8/12/82)
	522550025	Excavate, Repair and Backfill Piezometer MP-2	1 (4/5/83)
	522550020	Repair Six (6) Existing Observation Wells (WB-1, WP-2, COE-10, PD-18, W-2, PD-38)	1 (4/5/83)
	125150051	Install Clay to Below Duct Bank (pit 4)	1 (8/12/82)

Consumers Power Company
Midland Plant Units 1 & 2

Attachment to Serial CSC-6798

WORK ACTIVITY LIST FOR THE PERIOD BETWEEN AUGUST 1, 1983 and AUGUST 31, 1983
DEVELOPED IN COMPLIANCE WITH ASLB ORDER OF APRIL 30, 1982

NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
	125150052	Repair Ductbank (Pit 4) (includes excavate, drift, repair and backfill)	1 (8/25/82)
	115150026	Remove 36" Casing and Backfill 42" Hole	1 (9/17/82)
	115150025	Clean out and backfill abandoned ejector holes (ME26A, ME28A and ME54)	R
*	102550135	Install piezometers BB1 & BB2 in Auxiliary Building Control Tower	A(07/28/83)
		CRACK MAPPING (includes scaffolding platforms, ladders and extra-ordinary clean up)	
	102250200	EPA (East & West)	3 (8/12/82) A (8/12/82)
	102250105	FIVP (East & West)	3 (8/12/82) A (8/12/82)
	102250100	Control Tower & Remainder of Aux Bldg	3 (8/12/82) A (8/12/82)
		PIER 12W	
	165054010	Install & Load Pier $12W^3$	1 (8/12/82) A (12/9/82)
		PIER 11W	
	165054015	Install & Load Pier $11W^3$ (includes install bituminous plywood forms)	1 (8/25/82) A (2/22/83)
		PIER 9W	
	165054005	Install & Load Pier $9W^3$	1 (9/17/82) A (2/24/83)
		PIER 12E	

Consumers Power Company
Midland Plant Units 1 & 2

Attachment to Serial CSC-6798

WORK ACTIVITY LIST FOR THE PERIOD BETWEEN AUGUST 1, 1983 and AUGUST 31, 1983
DEVELOPED IN COMPLIANCE WITH ASLB ORDER OF APRIL 30, 1982

NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
	155054010	Install & Load Pier 12E[3]	1 (8/12/82) A (12/9/82)
		PIER 11E	
	155054015	Install & Load Pier 11E[3]	1 (8/25/82) A (2/22/[illegible])
		PIER 9E	
	155054005	Install & Load Pier 9E[3]	1 (9/17/82) A (2/24/83)
		PIER 8E	
	155054020	Install & Load Pier 8E[3]	1 (9/17/82) A (5/3/83)
		GRILLAGE STRUCTURE AT PIER 8E	
	155053025	Excavate for Support Columns next to Containment[2]	1 (9/17/82) A (6/20/83)
	155055003	Install Steel Support Columns next to Containment	1 (9/17/82) A (6/20/83)
	155055010	Install & Load Grillage Structure at Pier 8E	1 (9/17/82) A (6/20/83)
		PIER 8W	
	165054020	Install & Load Pier 8W[3]	1 (9/17/82) A (5/3/83)
		GRILLAGE STRUCTURE AT PIER 8W	
	165053025	Excavate for Support Columns next to Containment[2]	1 (9/17/82) A (6/20/83)
	165055003	Install Steel Support Columns next to Containment	1 (9/17/82) A (6/20/83)
	165055010	Install & Load Grillage Structure at Pier 8W	1 (9/17/82) A (6/20/83)

Consumers Power Company
Midland Plant Units 1 & 2

Attachment to Serial CSC-6798

WORK ACTIVITY LIST FOR THE PERIOD BETWEEN AUGUST 1, 1983 and AUGUST 31, 1983
DEVELOPED IN COMPLIANCE WITH ASLB ORDER OF APRIL 30, 1982

NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION	
		EXCAVATION ZONES		
	155052020	Excavate/Lag Zone Y1	1 (4/5/83)	A (6/20/83)
	165052020	Excavate/Lag Zone Z1	1 (4/5/83)	A (6/20/)
	165056375	Excavate/Lag Zone Z2		A (5/27/83)
	155056375	Excavate/Lag Zone Y2		A (5/27/83)
		PIER W10		
	165054030	Install & Load Pier 10W[3]	1 (4/5/83)	A (5/3/83)
		PIER E10		
	155054030	Install & Load Pier 10E[3]	1 (4/5/83)	A (5/3/83)
		SLAB Modification at El 659.0'		
	102250208	Survey/Layout for Engineering Review in Preparation for Slab Fix @ El 659	3 (4/5/83)	A (4/5/83)
		PIER KC2		
	165054315	Install & Load Pier KC2[3]	1 (9/17/82)	A (4/22/)
		PIER KC11		
	155054315	Install & Load Pier KC11[3]	1 (9/17/82)	A (4/22/83)
		PIER KC3		
	165052310	Drift to KC3 from W8[1]		A (07/28/83)
	165053310	Excavate Pier KC3[2]		A (07/28/83)
	165054305	Install & Load KC3[3]		A (07/28/83)

Consumers Power Company
Midland Plant Units 1 & 2

Attachment to Serial CSC-6798

WORK ACTIVITY LIST FOR THE PERIOD BETWEEN AUGUST 1, 1983 and AUGUST 31, 1983
DEVELOPED IN COMPLIANCE WITH ASLB ORDER OF APRIL 30, 1982

NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
		PIER KC10	
	155052310	Drift to KC10 from E8[1]	A (07/28/83)
	155053310	Excavate Pier KC10[2]	A (07/28/83)
	155054305	Install & Load KC10[3]	A (07/28/83)
		PIER W14	
	165052057	Drift From West Access Shaft to Pier W14[1] (includes Access Pit)	A (5/27/83)
	165053055	Excavate Pier W14[2]	A (5/27/83)
	165054050	Install Pier W14	A (5/27/83)
		PIER E14	
	155052057	Drift from East Access Shaft to Pier E14[1] (includes Access Pit)	A (5/27/83)
	155053055	Excavate Pier E14[2]	A (5/27/83)
	155054050	Install Pier E14	A (5/27/83)

Consumers Power Company
Midland Plant Units 1 & 2

Attachment to Serial CSC-6798

WORK ACTIVITY LIST FOR THE PERIOD BETWEEN AUGUST 1, 1983 and AUGUST 31, 1983
DEVELOPED IN COMPLIANCE WITH ASLB ORDER OF APRIL 30, 1982

NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
		SERVICE WATER PUMP STRUCTURE UNDERPINNING PROGRAM	
		POST TENSIONING SYSTEM	
	202555170	Post Tensioning Tendon inspection & maintenance	3(12/7/82) A (12/7/f
		DEWATERING	
	207050605	Install Remaining Ejector Wells	A (6/23/83)
	207050385	Core Drill SWPS Slab for Ejector Wells	A (3/17/83)
	207050386	Core Drill CWIS Slab for Ejector Wells	1(11/1/82) A (3/17/83)
	207050748	Probe for Deep Utilities Outside El 610 Excavation Limits (Ref Dwg C-2031)	1 (4/5/83) A (5/27/83)
	207050380	Core drill SWPS and CWIS slabs for Piezometers	A (4/13/83)
	207050600	Install Piezometers	A (6/23/83)
	207050635	Install Dewatering Discharge System (including headers, tank, pumps and electrical)	2 (9/17/82) A (6/23/8?)
	207050387	Convert 7 Wells used on 72" pipe repair to support SWPS dewatering. (Includes install new ejectors, temporary headers, operate, & maintain)	1(11/1/82) A (2/11/83)
		Fill SWPS Chambers (Bays)	
	203150165	Fill SWPS Chambers with Water to El 622 (±5')	
		Modify Pipe Supports	
	202550164	SWPS - Modify pipe supports to allow for design load (30" OHBC 34, 20 & 16)	A (5/27/83)

Consumers Power Company
Midland Plant Units 1 & 2

Attachment to Serial CSC-6798

WORK ACTIVITY LIST FOR THE PERIOD BETWEEN AUGUST 1, 1983 and AUGUST 31, 1983
DEVELOPED IN COMPLIANCE WITH ASLB ORDER OF APRIL 30, 1982

NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
**		ACCESS SHAFT & EXCAVATION	
	207050335	Install Soldier Piles	1 (8/12/82) A (5/27/83)
		BUILDING MONITORING	
	202550100	Install Deep Seated Bench Marks	1 (8/12/82) A (4/4/83)
	206050105	Crack Map SWPS	1 (9/17/82) A (3/10/83)
	202550130	Installation of Extensometer Anchors	1 (4/5/83) A (4/13/83)
	202550120	Installation of Extensometer Covers	3 (4/5/83) A (4/5/83)
	206050100	Install Extensometers	1 (9/17/82) A (5/27/83)
	206050106	Install Instruments and Terminate Instrument Cables (Includes testing & calibration)	1 (9/17/82) A (5/27/83)
	206050102	Install Brackets	1 (9/17/82) A (4/20/83)
	207550103	Install Conduit & Raceway	1 (9/17/82) A (2/22/83)
	202550104	Install cable and terminate at Data Acquisition Room	1 (9/17/82) A (5/27/83)
	206050101	Install Permanent Benchmark Covers	1 (9/17/82) A (4/20/83)
	206050104	Baseline, Operate, and Maintain Instrument System	R
		DUCTBANK PENETRATION	
*	852450105	SWPS - Provide Ducktbank Penetration in SWPS Wall and install pull box.	

Consumers Power Company
Midland Plant Units 1 & 2

Attachment to Serial CSC-6798

WORK ACTIVITY LIST FOR THE PERIOD BETWEEN AUGUST 1, 1983 and AUGUST 31, 1983
DEVELOPED IN COMPLIANCE WITH ASLB ORDER OF APRIL 30, 1982

NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
		BORATED WATER STORAGE TANK FOUNDATION & TANK REPAIR PROGRAM	
		UNIT 1 TANK	
	312150005	Drill and Grout Shear Connectors	2(12/13/82) A (4/20/)
	312150007	Prepare concrete surfaces, drill holes & remove concrete for rebar.	A (4/20/83)
	312150011	Construct New Ring Beam (set forms & place rebar, pour concrete)	1 (8/12/82) A (7/8/83)
	312550019	Reinstall Electrical Ductbank	2 (9/17/82) A (4/6/83)
	312550018	Reinstall Piping, Pipe Hangers and Electrical Facilities	A (3/17/83)
		UNIT 2 TANK	
	322150005	Drill and Grout Shear Connectors	2(12/13/82) A (4/20/83)
	322150007	Prepare concrete surfaces, drill holes & remove concrete for rebar	A (4/20/83)
	322150011	Construct New Ring Beam (set forms & place rebar, pour concrete)	1 (8/12/82) A (7/8/83)
	322550019	Reinstall Electrical Duct Bank	2 (9/17/82) A (4/6/83)
	322550018	Reinstall Piping, Pipe Hangers and Electrical Facilities	A (3/17/83)
	322150212	Repair Tank Weld Defect	R

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Midland Plant Units 1 & 2

Attachment to Serial CSC-6798

WORK ACTIVITY LIST FOR THE PERIOD BETWEEN AUGUST 1, 1983 and AUGUST 31, 1983
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NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
		UNDERGROUND PIPE REPLACEMENT, REBEDDING, AND MONITORING PROGRAM	
		SHALLOW PROBING FOR PHASE II	
	407050400	Shallow probing for Phase II (Ref DWG C-2031)	A (5/27/83)
		TRAIN A OF SERVICE WATER PIPE REPLACEMENT[4]	
	402550500	Excavate Existing Pipe	1 (8/12/82) A (5/27/83)
	402550510	Remove Existing Pipe	1 (8/25/82) A (5/27/83)
	402550520	Install new pipe & expansion coupling	1 (8/25/82) A (5/27/83)
	402550515	Hydro Test new pipe	A (5/27/83)
	402550507	Perform Profiling & Ovality Check on New Piping	A (5/27/83)
	402550525	Temporary Backfill New Pipe	1 (4/5/83)
		CONSTRUCTION WORK IN SOIL MATERIAL PROGRAMS	
		PERMANENT INTRUSION DETECTION SYSTEM	
	732050002	Install Wire (incl conduit)	3 (8/25/82) A (8/25/82)
	732050003	Install Fence (incl fence posts & concrete strip)	3 (8/25/82) A (8/25/82)
	732050004	Install Grounding	3 (9/17/82) A (9/17/82)

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Midland Plant Units 1 & 2

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WORK ACTIVITY LIST FOR THE PERIOD BETWEEN AUGUST 1, 1983 and AUGUST 31, 1983
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NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
		OBS-4 Repair	
	522550018	Dutch Cone Soil Testing in Vicinity of OBS-4 for exploratory purposes	A (07/28/83)
		Acid-Caustic Unloading Station	
	822550001	Excavate, install and backfill drainline and slab for Acid-caustic unloading station at East end of Turbine Building	1 (11/1/82) A (4/20/83)
		EMERGENCY PERSONNEL LOCKS - UNIT 2	
	792550005	Excavate, rebar, pour concrete and backfill Airlock Structure	1 (9/17/82)
		SIT/ILRT TEST FACILITIES	
	862450105	Exploratory Excavation at SIT/ILRT Duct Bank	A(5/27/83)
		PERMANENT DEWATERING PROGRAM	
	522150005	Install Remaining Wells	1 (9/17/82)
	522550016	Install electrical equipment & conduit	1 (9/17/82)
**	522550020	Excavate, install and backfill header piping, electrical conduit, and pumps (including equipment slabs and metering pits)	1 (9/17/82)
	522550025	Assemble and wire pump control panels	

Consumers Power Company
Midland Plant Units 1 & 2

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WORK ACTIVITY LIST FOR THE PERIOD BETWEEN AUGUST 1, 1983 and AUGUST 31, 1983
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NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
		DIESEL FUEL SUPPLY LINES	
	722050001	Install missle shielding	1 (8/25/82)
	722050002	Excavate, remove, reinstall and backfill DFO supply lines	1 (11/1/82)
	802450005	Exporatory excavation for examiniation of diesel fuel oil lines	A (4/13/83)
		DIKE MAINTENANCE	
	812550010	Normal dike maintenance in Q areas	A (5/27/83)
		CONTROL ROOM PRESSURIZATION TANK SETTLEMENT MARKERS	
	932450100	Excavate for, install and backfill Control Room pressurization tank settlement markers	
		MISCELLANEOUS	
	942450200	Remove (excavation) temporary uncontrolled fill located in Q areas (DWG C-45Q) as identified on NCRs and the OGSE action item logs, and backfill per Spec C-211Q	1 (7/5/83)
*	942450300	Excavate and backfill trench for ground cable east of Tech Support Center.	3 (7/15/83) A (7/15/83)
		CATHODIC PROTECTION	
	752050001	Drill and replace annodes (as necessary)	1 (8/25/82)
	752050002	Drill and install new annodes	1 (11/1/82)

Consumers Power Company
Midland Plant Units 1 & 2

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SUPPLEMENTAL WORK ACTIVITY LIST FOR THE PERIOD BETWEEN SEPTEMBER 1, 1983 AND SEPTEMBER 30, 1983
DEVELOPED IN COMPLIANCE WITH ASLB ORDER OF APRIL 30, 1982

NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
		AUXILIARY BUILDING & FIVP UNDERPINNING PROGRAM	
		SUPPORT BRACKET	
	152555010	Install Temporary Support Bracket at E1	
	162555010	Install Temporary Support Bracket at W1	
		PIER E13	
	155053040	Excavate Pier E13[2]	A (5/27/83)
	155054035	Install Pier E13	A (5/27/83)
		PIER W13	
	165053040	Excavate Pier W13[2]	A (5/27/83)
	165054035	Install Pier W13	A (5/27/83)
		DOWELS AT FIVP	
	155050325	Install dowels at east FIVP	
	165050325	Install dowels at west FIVP	
		LEVEL C WALES	
	165055305	Install Level C Wales, West Side	A (5/27/83)
	155055305	Install Level C Wales, East Side	A (5/27/83)

Consumers Power Company
Midland Plant Units 1 & 2

Attachment to Serial CSC-6798

SUPPLEMENTAL WORK ACTIVITY LIST FOR THE PERIOD BETWEEN SEPTEMBER 1, 1983 AND SEPTEMBER 30, 1983
DEVELOPED IN COMPLIANCE WITH ASLB ORDER OF APRIL 30, 1982

NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
		PIER CT12	
	155052035	Drift to CT12 from UAT[1]	
	155053050	Excavate Pier CT12[2]	
	155054045	Install & Load Pier CT12[3]	
		PIER CT1	
	165052035	Drift to CT1 from UAT[1]	
**	165053050	Excavate Pier CT1[2]	
	165054045	Install & Load Pier CT1[3]	
		PIER KC4	
	155052032	Finger Drift to KC4[1]	
	155053315	Excavate Pier KC4[2]	
	155054310	Install & Load Pier KC4[3]	
		PIER KC9	
	165052032	Finger Drift to KC9[1]	
	165053315	Excavate Pier KC9[2]	
	165054310	Install & Load Pier KC9[3]	
		LONG DRIFTS	

Consumers Power Company
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NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
	155052320	Drift to KC4 from KC3[1]	
	165052320	Drift to KC9 from KC10[1]	A (07/28/83)
	155052030	Drift to KC3 from KC2[1]	A (07/28/83)
	165052030	Drift to KC10 from KC11[1]	
**	155054515	Construct concrete invert and layback soil KC2 to KC3	1 (7/5/83)
**	165054515	Construct concrete invert and layback soil KC11 to KC10	1 (7/5/83)
		UNDERGROUND PIPE REPLACEMENT, REBEDDING, AND MONITORING PROGRAM	
		TRAIN B OF SERVICE WATER PIPE REPLACEMENT[4]	
	402550446	Excavate Existing Pipe	1 (8/12/82)
	402550550	Remove Existing Pipe	R
	402550560	Install new pipe & expansion coupling	R
	402550561	Hydro Test new pipe	R
	402550508	Perform Profiling & Ovality Check on New Piping	R
	402550562	Temporary Backfill New Pipe	1 (4/5/83)

Consumers Power Company
Midland Plant Units 1 & 2

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NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
		SERVICE WATER PUMP STRUCTURE UNDERPINNING PROGRAM	
		EXCAVATION	
**	207050781	Excavate, lag, brace and install wales and struts in upper east section of SWPS access shaft (soldier piles 14 thru 30 - maximum excavation to EL 618'-3" excluding localized excavation at pipe supports).[5]	
	207050782	Excavate, lag, brace and install wales and struts in upper west section of SWPS access shaft (soldier Piles 1 thru 14 - maximum excavation to EL 624'-9" excluding localized excavation at pipe supports.)[5]	
	207050783	Excavate lag, brace and install wales and struts, pour and cure concrete mudmat in lower east section of SWPS access shaft (soldier piles 15 thru 30 - maximum excavation to EL 618'±6" excluding localized excavation.)[5]	1 (7/5/83)
	207050784	Excavate, lag, brace and install wales and struts, pour and cure concrete mudmat in lower west section of SWPS access shaft (soldier piles 1 thru 14 - maximum excavation to EL 618'±6" excluding localized excavation.)[5]	1 (7/5/83)
	202550163	Remove abandoned fire protection pipeline	1 (11/1/82) A (5/27/83)
		DEWATERING SYSTEM	
	207050620	Activate, Operate and Maintain Dewatering System	1 (9/17/82) A (5/27/83)
		BORATED WATER STORAGE TANK FOUNDATION AND TANK REPAIR PROGRAM	

Consumers Power Company
Midland Plant Units 1 & 2

Attachment to Serial CSC-6798

SUPPLEMENTAL WORK ACTIVITY LIST FOR THE PERIOD BETWEEN SEPTEMBER 1, 1983 AND SEPTEMBER 30, 1983
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NEW OR REVISED ITEMS	ACTIVITY IDENTIFIER	PROGRAM, WORK AREA & ACTIVITY	PREVIOUS REGION III DESIGNATION
	312150015	Relevel Tank-Unit 1	1 (9/17/82)
	312550100	Install Instruments (includes testing and calibration)	1 (11/1/82)
	322550100	Install Instruments (includes testing and calibration)	1 (11/1/82)
		CONSTRUCTION WORK IN SOIL MATERIAL PROGRAMS	
		PERMANENT DEWATERING	
	522550014	Excavate Headers & Metering Pits, Install Header and Level Monitoring System, Install Pumps, Timers and Backfill	
		CONTAINMENT TENDON ACCESS VENT HVAC	
	802550010	Excavate for, Install and Backfill Electrical Duct Bank and Equipment Pad for the Unit 1 HVAC Fan	1 (9/17/82)
	802550020	Excavate for, Install and Backfill Electrical Duct Bank and Equipment Pad for the Unit 2 HVAC Fan	1 (9/17/82)
		NITROGEN TANK INSTALLATION	
	782550005	Excavate for, install and backfill electrical duct bank	1 (9/17/82)
	782550010	Excavate for, install and backfill piping	1 (9/17/82)
	782550015	Excavate for, install and backfill concrete pad	1 (9/17/82)
	782550020	Excavate for, install and backfill nitrogen tanks and associated concrete structures	1 (9/17/82)

Consumers Power Company

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Executive Manager
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July 27, 1983

Mr J J Harrison
Midland Project Section
U S Nuclear Regulatory Commission
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799 Roosevelt Road
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MIDLAND ENERGY CENTER GWO 7020
REMEDIAL SOILS CONCRETE MIX
File: 0485.16 UFI: 42*05*22*04 Serial: CSC-6815
70*01

This letter summarizes the telephone conversation 7/26/83, between Dr. R. Landsman of NRC Region III, R. Wieland and K. Razdan of CPCo, and I. Jha, V. Patankar, and M. DasGupta, of Bechtel Project Engineering. Three new concrete mix designs have been developed for addition to Spec C-230 for use in the underpinning work. After discussing the proportioning and qualification of mixes C-6C-H and E-5C-H (with superplasticizer) and mix E-5C (without superplasticizer), Dr. Landsman concurred with CPCo's use of these for the underpinning work.

JAMooney

JAM/RHW/klm

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AUG 1 1983

Consumers Power Company

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July 27, 1983

Mr J J Harrison
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MIDLAND ENERGY CENTER GWO 7020
REMEDIAL SOILS WORK AUTHORIZATION
File: 0485.16 UFI: 42*05*22*04 Serial: CSC-6817
12*32

We have reviewed the work packages for the following activities. In accordance with the Work Authorization Procedure, we request your concurrence to perform the work:

162550100	Exploratory probe for UAT (west)
162550012	Pregrout from UAT (west)
152550100	Exploratory probe for UAT (east)
152550012	Pregrout from UAT (east)
102550135	Install piezometers BB1 and BB2 in Auxiliary Building Control Tower
155052035	Drift to CT12 from from UAT
155053050	Excavate Pier CT12
155054045	Install and load Pier CT12
165052035	Drift to CT1 from UAT
165053050	Excavate Pier CT1
165054045	Install and load Pier CT1
155052030	Drift to Kc3 from Kc2
165052030	Drift Kc10, from Kc11
132550027	Install strain gauges and terminate cables (includes testing and calibration)

JAM/RHW/klm

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July 25, 1983

Mr J J Harrison
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799 Roosevelt Road
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MIDLAND ENERGY CENTER GWO 7020
REMEDIAL SOILS WORK AUTHORIZATION
File: 0485.16 UFI: 42*05*22*04 Serial: CSC-6810
12*32

A number of activity authorizations have passed the 90 day expiration limit. In accordance with the Work Authorization Procedure, we request re-authorization of the following activities:

165052310 - Drift to Kc3 From W8
165053310 - Excavate Pier Kc3
165054305 - Install and Load Kc3
155052310 - Drift to Kc10 From E8
155053310 - Excavate Pier Kc10
155054305 - Install & Load Kc10
522550018 - Dutch Cone Soil Testing in Vicinity of OBS-4 For Exploratory Purposes

John Schaub
For JOM

JAM/RHW/klm

8308030018

JUL 29 1983

Sent to DMB 8/31/83

Consumers Power Company

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July 15, 1983

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MIDLAND ENERGY CENTER PROJECT GWO 7020
MIDLAND SOILS TELECON OF JUNE 30, 1983
File: 0485.16 UFI: 42*05*22*04 Serial: 23706
12*32

A telecon was arranged between the participants listed below on June 6, 1983 to discuss Consumers Power Company's request for NRC authorization to use the Utility Access Tunnel (UAT) as a means of constructing Piers CT1 and 12. Utilizing the UAT allows loading of CT1 and CT12 prior to removing the soil from KC-4 to KC-5 and from KC-9 to KC-8. This approach was earlier presented to the Case Load Forecast Panel, NRC Region III and NRR. The purpose of this telephone conversation was to review the details with the staff.

PARTICIPANTS

J Kane, NRC
R Landsman, NRC
S Poulos, NRC (Consultant)

K Razdan, CP Co
R Wieland, CP Co

*J Darby, Bechtel
*M Lewis, Bechtel
V Verma, Bechtel

(*Part Time)

As noted below, the subjects covered not only the UAT but also other items related to the underpinning of the auxiliary building.

The following is a summary of the discussions and agreements during the telecon. The responses to various items are a follow-up to the staff's request for further information.

Item 1 - Building Movement

NRC Region III was informed on 6/28/83 that there was an increase in the settlement trend of Δ_1 value associated with DSB 2W. An update on the building movements at the end of the EPA's was provided. It was pointed out to the NRC that based on the present trends of differential settlement (Δ_1),

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at the west EPA, that the phase III alert level could be reached sometime in the beginning of September, 1983 (assuming the grillage at Pier 8 is not jacked). However, based on the present progress, it is expected that the grillage at Pier 8 would be jacked near the end of August, 1983. The Δ_1, at the east end of the EPA is much smaller. The NRC was informed that the strain readings in the critical areas were consistent with the order of magnitude of the Δ_1 readings. Also, no change in crack widths has been detected since drifting under the EPA. The movement under the west EPA started in early May, 1983.

CPCo agreed to send the following information to the NRC:

A. Updated absolute settlement plots;

B. Updated plots of Δ_1 including explanations of any local variations and conclusions about the trend;

C. Plots of strain in critical building areas since the beginning of May, 1983. (CPCo also committed to maintain these plots in future in addition to the present tabulation);

D. Plot showing the construction events on the same scale as the settlement plots of A & B;

E. The RGE's daily report giving the sketches of a void encountered under the west EPA and the details relative to the actions taken.

Response 1

Enclosures 1-5 cover the various plots and data requested.

Item 2 - Crack Monitoring

A discussion on crack monitoring took place with the NRC observing that there were alternative methods for measuring crack width.

Response 2

The present measuring technique has produced data with a high degree of reliability, as demonstrated by the consistency of data from reading to reading. CPCo proposes no changes in the system at this time.

Item 3 - Load Test Report

The NRC indicated that the load test report for Pier W11 delineated in Spec C-195, Appendix D should be submitted to them. The NRC indicated that it is not necessary that this report be submitted prior to approval of the Pier CT-1/CT-12 work package.

Response 3

The report will be submitted under separate cover.

Item 4 - Load Test Letter

The NRC indicated that they had not reviewed the CPCo letter dated June 9, 1983 regarding the options adopted after the pier load test. It was indicated that after their review, conference call would be held between CPCo and NRC (R Landsman, J Kane, S Poulous and F Rinaldi) to discuss this letter. R Landsman indicated that the NRC would like to discuss an audit of the calculations which form the basis of the June 9, 1983 letter.

Response 4

The calculations and all data are available for review by the NRC upon request.

Item 5 - Tie Backs

S Poulos commented that the Tie Back System submitted with telecon notes of March 7 and 8, 1983 seems to be large and has extensive trusses. He remarked that maybe it could be made more economical by providing diagonal ties between the top of the piers and the Turbine Mat. It was decided that a conference call would be held between CPCo and NRC (F Rinaldi and R Landsman) to discuss NRC's comments on the tie back scheme.

Response 5

CPCo will participate in a conference call as requested.

Item 6 - Utility Access Tunnel (UAT)

A discussion was held regarding the access through the UAT. The sketches of this scheme were included with the telecon notes of March 7 and 8, 1983. It was indicated to the NRC that Pier CT-1 would not be approached until the grillage at Pier W8 was jacked.

At this stage, Pier KC3 may (as noted on this schedule) be completed. Pier W5 and excavation for grillage at Pier W5 would not be initiated until CT-1 is jacked. However, the long drift to KC-4 and Pier KC-4 may be completed before jacking Pier CT-1. The long drift from KC-4 to KC-5 will not be started until CT1 is loaded. The NRC commented that when the grillage at W5 is jacked, after jacking CT-1, there will be a hard spot, at the CT-1 pier, which may attract more load. CPCo indicated that provisions have been made in the design for this condition as follows:

A. Reserve capacity of approximately 60% for the CT-1 pier (the anticipated load on this pier, based on contributory load, is 750 tons. However, the pier and its bell footing have been designed for a load of 1125 tons).

B. The provision in the specification that during jacking of the grillage at W5, CT-1 may be kept on active jacks to limit load.

C. The provision in the specification that during jacking of the grillage at Pier W5, corrective action be taken on reaching a small settlement (approximately 10 mils) at Pier CT-1.

Note: The above discussion is applicable to equivalent piers on east side of building.

Response 6

The sequence of W8 followed by CT-1 followed by W5 is the same as originally planned and approved by the NRR as shown in SSER-2 Page I-15, Items 3.1, 3.2, 3.3 and 3.4. The UAT concept changes only the construction, not the design, and, as discussed, the construction access change actually enhances the design by not having the KC-4 to KC-5 drift in place until CT-1 is loaded.

Item 7 - Grouting

The NRC questioned whether provisions for emergency grouting in the control tower area are in place.

Response 7

The present equipment is available and adequate for emergency use.

Item 8 - Wedges

The present system of rejacking was discussed. It was pointed out that rejacking requirements are determined by using data from the monitoring system. The NRC questioned whether this was adequate criteria relative to individual wedge loosening.

Response 8

CPCo feels present method is adequate and conformance with industry practices and further notes that the wedges have performed well to date without any problem. However, CPCo will participate in a future discussion on this issue if requested.

Item 9 - May 12 and 13, 1983 Site Visit

NRC indicated that D Hood would be issuing an action item list from their May 12 and 13 site visit and CPCo should pursue this with D Hood.

Response 9

CPCo will respond to the NRC action item list when it is issued.

Item 10 -CT1/12 Approval

R Landsman pointed out that before approving Pier CT-1/12 package, he would like Items 4, 7 and 8 to be resolved.

Response 10

No response required.

Item 11 - Carlson Stress Meters

CPCo indicated that the following changes had been made in the Carlson Stress Meters as a result of the pier load test:

A. The rebar, at the top of the Carlson Stress Meters, to support the Carlsons had been removed.

B. The Carlson Meters are being calibrated after encasement in the protective concrete.

Response 11

No response required.

JAM/RHW/klm

	ACTION	INFORMATION
J W Cook, P26-336B	———	———
R A Wells, MPQAD	———	———
A J Boos, Bechtel Ann Arbor	———	———
J A Mooney, P14-115A	———	———
J E Brunner, M-1079	———	———
J R Schaub, P14-305	———	———
R C Bauman, P14-314B	———	———
W R Bird, P14-418A	———	———
J K Meisenheimer, Midland	———	———
A R Mollenkopf, P14-408A	———	———
D B Miller, Midland	———	———
J Simpson, FSO	———	———
F W Buckman, P24-624A	———	———
D B Budzik, P24-517A	———	———
N J Saari, Midland	———	———
D F Lewis, Bechtel Ann Arbor	———	———
R W Huston, Consumers Power Company 7910 Woodmont Avenue Suite #220 Bethesda, Maryland 20014	———	———
R L Tueteberg, P24-505	———	———
NRC Correspondence File, P24-517	———	———
Mr. Mike Miller Isham, Lincoln & Beale 3 First National Plaza, Suite #5100 Chicago, IL 60602	———	———
Isham, Lincoln & Beale 1120 Connecticut Avenue N.W. Washington, D.C. 20036	———	———
R M Wheeler, Midland	———	———
A E Blocher, Midland	———	———
T R Thiruvengadam, P14-400	———	———
Neil Swanberg, Bechtel Ann Arbor	———	———
Mr. Ron Callen Michigan Public Service Commission 6545 Mercantile Way Lansing, MI 48909	———	———

File: 0-85.16 UFI: 42*05*22*04

Consumers Power Company

J A Mooney
Executive Manager
Midland Project Office

General Offices: 1945 West Parnall Road, Jackson, MI 49201 • (517) 788-0774

July 15, 1983

Mr J J Harrison
Midland Project Section
US Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

MIDLAND ENERGY CENTER PROJECT GWO 7020
MIDLAND SOILS TELECON OF JUNE 30, 1983
File: 0485.16 UFI: 42*05*22*04 Serial: 23706
12*32

A telecon was arranged between the participants listed below on June 6, 1983 to discuss Consumers Power Company's request for NRC authorization to use the Utility Access Tunnel (UAT) as a means of constructing Piers CT1 and 12. Utilizing the UAT allows loading of CT1 and CT12 prior to removing the soil from KC-4 to KC-5 and from KC-9 to KC-8. This approach was earlier presented to the Case Load Forecast Panel, NRC Region III and NRR. The purpose of this telephone conversation was to review the details with the staff.

PARTICIPANTS

J Kane, NRC
R Landsman, NRC
S Poulos, NRC (Consultant)

K Razdan, CP Co
R Wieland, CP Co

*J Darby, Bechtel
*M Lewis, Bechtel
V Verma, Bechtel

(*Part Time)

As noted below, the subjects covered not only the UAT but also other items related to the underpinning of the auxiliary building.

The following is a summary of the discussions and agreements during the telecon. The responses to various items are a follow-up to the staff's request for further information.

Item 1 - Building Movement

NRC Region III was informed on 6/28/83 that there was an increase in the settlement trend of Δ_1 value associated with DSB 2W. An update on the building movements at the end of the EPA's was provided. It was pointed out to the NRC that based on the present trends of differential settlement (Δ_1),

at the west EPA, that the phase III alert level could be reached sometime in the beginning of September, 1983 (assuming the grillage at Pier 8 is not jacked). However, based on the present progress, it is expected that the grillage at Pier 8 would be jacked near the end of August, 1983. The Δ_1, at the east end of the EPA is much smaller. The NRC was informed that the strain readings in the critical areas were consistent with the order of magnitude of the Δ_1 readings. Also, no change in crack widths has been detected since drifting under the EPA. The movement under the west EPA started in early May, 1983.

CPCo agreed to send the following information to the NRC:

A. Updated absolute settlement plots;

B. Updated plots of Δ_1 including explanations of any local variations and conclusions about the trend;

C. Plots of strain in critical building areas since the beginning of May, 1983. (CPCo also committed to maintain these plots in future in addition to the present tabulation);

D. Plot showing the construction events on the same scale as the settlement plots of A & B;

E. The RGE's daily report giving the sketches of a void encountered under the west EPA and the details relative to the actions taken.

Response 1

Enclosures 1-5 cover the various plots and data requested.

Item 2 - Crack Monitoring

A discussion on crack monitoring took place with the NRC observing that there were alternative methods for measuring crack width.

Response 2

The present measuring technique has produced data with a high degree of reliability, as demonstrated by the consistency of data from reading to reading. CPCo proposes no changes in the system at this time.

Item 3 - Load Test Report

The NRC indicated that the load test report for Pier W11 delineated in Spec C-195, Appendix D should be submitted to them. The NRC indicated that it is not necessary that this report be submitted prior to approval of the Pier CT-1/CT-12 work package.

Response 3

The report will be submitted under separate cover.

Item 4 - Load Test Letter

The NRC indicated that they had not reviewed the CPCo letter dated June 9, 1983 regarding the options adopted after the pier load test. It was indicated that after their review, conference call would be held between CPCo and NRC (R Landsman, J Kane, S Poulous and F Rinaldi) to discuss this letter. R Landsman indicated that the NRC would like to discuss an audit of the calculations which form the basis of the June 9, 1983 letter.

Response 4

The calculations and all data are available for review by the NRC upon request.

Item 5 - Tie Backs

S Poulos commented that the Tie Back System submitted with telecon notes of March 7 and 8, 1983 seems to be large and has extensive trusses. He remarked that maybe it could be made more economical by providing diagonal ties between the top of the piers and the Turbine Mat. It was decided that a conference call would be held between CPCo and NRC (F Rinaldi and R Landsman) to discuss NRC's comments on the tie back scheme.

Response 5

CPCo will participate in a conference call as requested.

Item 6 - Utility Access Tunnel (UAT)

A discussion was held regarding the access through the UAT. The sketches of this scheme were included with the telecon notes of March 7 and 8, 1983. It was indicated to the NRC that Pier CT-1 would not be approached until the grillage at Pier W8 was jacked.

At this stage, Pier KC3 may (as noted on this schedule) be completed. Pier W5 and excavation for grillage at Pier W5 would not be initiated until CT-1 is jacked. However, the long drift to KC-4 and Pier KC-4 may be completed before jacking Pier CT-1. The long drift from KC-4 to KC-5 will not be started until CT1 is loaded. The NRC commented that when the grillage at W5 is jacked, after jacking CT-1, there will be a hard spot, at the CT-1 pier, which may attract more load. CPCo indicated that provisions have been made in the design for this condition as follows:

A. Reserve capacity of approximately 60% for the CT-1 pier (the anticipated load on this pier, based on contributory load, is 750 tons. However, the pier and its bell footing have been designed for a load of 1125 tons).

B. The provision in the specification that during jacking of the grillage at W5, CT-1 may be kept on active jacks to limit load.

C. The provision in the specification that during jacking of the grillage at Pier W5, corrective action be taken on reaching a small settlement (approximately 10 mils) at Pier CT-1.

Note: The above discussion is applicable to equivalent piers on east side of building.

Response 6

The sequence of W8 followed by CT-1 followed by W5 is the same as originally planned and approved by the NRR as shown in SSER-2 Page I-15, Items 3.1, 3.2, 3.3 and 3.4. The UAT concept changes only the construction, not the design, and, as discussed, the construction access change actually enhances the design by not having the KC-4 to KC-5 drift in place until CT-1 is loaded.

Item 7 - Grouting

The NRC questioned whether provisions for emergency grouting in the control tower area are in place.

Response 7

The present equipment is available and adequate for emergency use.

Item 8 - Wedges

The present system of rejacking was discussed. It was pointed out that rejacking requirements are determined by using data from the monitoring system. The NRC questioned whether this was adequate criteria relative to individual wedge loosening.

Response 8

CPCo feels present method is adequate and conformance with industry practices and further notes that the wedges have performed well to date without any problem. However, CPCo will participate in a future discussion on this issue if requested.

Item 9 - May 12 and 13, 1983 Site Visit

NRC indicated that D Hood would be issuing an action item list from their May 12 and 13 site visit and CPCo should pursue this with D Hood.

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CPCo will respond to the NRC action item list when it is issued.

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Item 11 - Carlson Stress Meters

CPCo indicated that the following changes had been made in the Carlson Stress Meters as a result of the pier load test:

A. The rebar, at the top of the Carlson Stress Meters, to support the Carlsons had been removed.

B. The Carlson Meters are being calibrated after encasement in the protective concrete.

Response 11

No response required.

JAM/RHW/klm

MIDLAND UNITS 1 AND 2 · JOB 7220
RESIDENT GEOTECHNICAL ENGINEER REPORT

Date 6-22-83 Page 1 of 2
Shift DAY
A3

No.	Description	Remarks
	PIERS W9 WILL WORK ALSO EQ ELEV 12	
(1)	WE CONTINUED BHRS DIAL GAUGE SETTMT READS OF TOP & TIP OF THE PIERS TESTING OF WEDGES CONTINUED PIER PIT W-8 (ACCESS DRIFT.)	NOTE REG. ITEM #3. RGE NOTED THAT ASS VOID 1/4" TO 1/2", 2' TO 4' WIDE WAS LOCATED DIRECTLY UNDER MAT AND ABOVE 18" THICK LAYER OF SAN THE EXTENT OF THESE VOIDS HAS NOT BEEN DETERMINED YET BU IT IS EXPECTED THAT THIS INSPECTION SHOULD BE COMPLETED ON 6/23.
(2)	THE PIER PIT HAS BEEN COVERED WITH PLYWOOD TEMPORARILY	
(3)	MERGENTIME EXTENDED EXCAVATION NORTH OF PIER PIT. THE TOE WAS EXTENDED TO WITHIN THE DISTANCE OF 3' FROM NORTH EDGE OF THE FOOT PR. 2'-0"± BERM WAS PROVIDED WITH A NEARLY VERT. CLAY FACE ABOVE THE DRIFT FLOOR AND 1:1± SLOPE IN CLAYEY FILL WAS EXCAVATED DUE NORTH. IT WAS NOTED THAT 18"± THICK LAYER OF SAND WAS LOCATED UNDER THE MUD MAT & FILL CONCRETE PART OF THE MUD MAT WAS ALSO REMOVED. EXCAVATION FOR THE (N-S) BULKHEAD (WEST SIDE)	
(4)	STATED CHIPPING GROUT AT THE (N-E) SECTION OF THE EXCAVATION, EAST OF THE EASTERN DRIFT SET LAGGING. (THIS GROUT WAS POURED IN THE SLOPE LAYBACK AT THE EAST END OF THE DRIFT) PIER PIT W-8 ACCESS DRIFT. (CONTINUED)	
(5)	NOTE: EXPOSED DSB-2W AT THE (N-E) SECTION SOME SATURATED CLAYEY MATERIAL WAS NOTED AT THE DSB-2W CASING. THERE WAS NO INDICATION THAT CHIPPING OF THE ADJACENT GROUT DAMAGED THIS DSB.	
(6)	RGE ADVISED THAT AN EXCESSIVE MVMT (SETTMT) OF THE STRUCTURE HAS BEEN RECORDED AT DSB-2W, AND THAT ROUTINE REJACKING OF PIER W-9, DUE TO THE MVMT OF THE STRUCTURE, WOULD BE REQUIRED. PIER W-9	
(7)	COMPLETED ROUTINE REJACKING DONE TO THE MVMT. OF STRUCTURE ON NOR SHIFT TODAY. APPLIED 110% OF STR LOAD AND HELD IT FOR 60 MINS. ALL WEDGES WERE FOUND TIGHT (COULD NOT BE MADE LOOSE WITH A CLAW HAMMER) TOTAL SETTMT. OF TOP OF PIER W9 STRUCTURE TO-DATE WAS 0.480". IT WAS DECIDED TO DRIVE WEDGES	

FOR INFORMATION ONLY
FS-03-03
7220

Signed Richard P. Cosby Date 6-22-83
Reviewed by J.M. Wampler Date 6-30-83

Distribution:
BAPE - E. STERL
PGE - J. ANDERSON

MIDLAND UNITS 1 AND 2 - JOB 7220
RESIDENT GEOTECHNICAL ENGINEER REPORT

Date 6-22-83 Page 2 of 2
Shift DAY
A3

No.	Description	Remarks
7 (CONTD)	AND DEPRESSURIZE THE JACKS AFTER 0.002" SETTLE IN A PERIOD OF 60 MINS. MINIMUM WAS RECORDED. RSE ADVISED RGE TO TERMINATE THE REJACKING. THE PRESSURE DROP DURING DRIVING OF THE WEDGES WAS 675 PSI. FINAL PRESSURE of 25PSI WAS REACHED BY 18:45 HRS.	
	PIER-W-10	
8	NO ACTIVITY NOTED AT THE PIER TODAY.	
	PIER KC-2	
9	CURING OF PIER CONCRETE CONTINUED.	
10	UPPER TELL-TALE P2 HAS BEEN DRYPACKED.	
	PIER E-8	
11	THE KEYER PIT SECTION WAS COVERED WITH PLYWOOD.	
	PIER E-8 (ACCESS DRIFT) AREA NORTH OF PIER E-8	
12	NOTE: RGE AGREED TO REVISE THE PROPOSED NORTH SLOPE FROM 1:1 TO 1HOR:3VERT. AND THUS LIMIT THE EXCAVATION MINIMUM UNDER AUX BLDG. THE WRITER DISCUSSED THIS REVISION WITH MESSRS. L. WILLIAMS & KILGORE THIS MORNING.	
	EXCAVATION FOR (N-S) BULKHEAD (EAST SIDE)	
13	STARTED DRILLING OUT A SECTION OF "KAYBACE GROUT" AT THE (N-W) SECTION.	
14	LAID OUT LOCATION OF HILTI BOLTS AT P3'S (WEST SIDE)	
	PIER E-10	
15	COMPLETED LOAD TRANSFER, 110% of SPEC LOAD, AT 3:20 PM TODAY AFTER "0.004" SETTLE CRITERIA IN SIX HRS" WERE REACHED AND SATISFIED. TOTAL SETTLE of TOP of PIER WRT STRUCTURE WAS .172" RSE ADVISED THAT THE JACKS WOULD BE ACTIVE FOR A LONGER PERIOD of TIME (WEDGES WILL NOT BE DRIVEN) AND WE WOULD READ GAUGES EVERY 8 HRS. RGE WILL NOT PARTICIPATE IN THE READING of THE GAUGES.	
	PIER KC-11	
16	UPPER TELL-TALE DRYPACKING HAS BEEN REPLACED	

RB-023-03

FOR INFORMATION ONLY

7220

Signed Richard F Cosley Date 6-23-83
Reviewed By J.W. Conrad Date 6-30-83

Distribution
BAPS - E. STEEL
PGE - J. ANDERSON

MIDLAND UNITS 1 AND 2 · JCE 7220

RESIDENT GEOTECHNICAL ENGINEER REPORT

Date 6-23-83 Page 1 of 2

Shift DAY A3

No.	Description	Remarks
	PIERS: WQ, W11, W12 ALSO EQ E11 & E12	
(1)	WTE CONTINUED SHPS DIAL GAUGE SETMT. RDGS. AT TOP & TIP OF THE PIERS.	
(2)	NOTE: RSE ADVISED RGE THAT "ROUTINE REJACKING DUE TO THE MVMT OF THE STRUCTURE" WOULD BE ACTIVATED TO 110% OF SPEC LOADS ON PIERS WQ, W11 & W12. REJACKING OF WQ, W11 & W12 STARTED AT 11:07 AM, 2:35 PM & 5:11 PM RESPECTIVELY.	
(3)	THE FOLLOWING RESULTS WERE NOTED ON DAY & NITE SHIFTS.	

PIER NO	TOTAL SETMT. TO DATE (DAY SHIFT)	TOTAL SETMT. TO DATE (NITE SHIFT)	NUMBER OF JACKS SHOWING 110%	NUMBER OF JACKS SHOWING 125%*
WQ	.488" / 110%	.513 / 125%*	0	(2)
W11	.697" / 110%	.708 / 125%	0	0
W12	.344" / 110%	.366 / 125%	0	(2)

(4) Δ4: -0.002" (DAY SHIFT)
: -0.005" (NITE ")

NOTE: 4 HR. READINGS WERE TAKEN ON ALL THREE PIERS BY END OF THE NITE SHIFT.

(*) RSE DECIDED TO INCREASE THE LOAD FROM 110% TO 125% OF SPEC. LOAD AT APPROX 8 PM DUE TO EXCESSIVE MVMT. OF STRUCT THE "ROUTINE REJACKING" STATUS WAS CHANGED TO "NON-ROUTINE"

PIER PIT W-B

(5) CONTINUED WORK ON SHAFT REBARS AND CLEAN UP OF THE PITS. PLACING OF THE CONCRETE HAS AGAIN BEEN DELAYED DUE TO PROBLEMS WITH INSTALL. OF REMAINING RE-BARS.

PIER W-10

(6) NO ACTIVITY NOTED AT THE PIER TODAY

PIER KC-2

(7) NO ACTIVITY NOTED AT THE PIER TODAY

ACCESS DRIFT TO PIER PIT W-B

(8) NO ACTIVITY AT NORTH OR SOUTH SIDES OF THE PIT EXCAVATION FOR (N-S) BULKHEAD (N-E SECTION OF ACCESS DRIFT PIT W-B)

NOTE: REG. NORTH SIDE O
ACCESS DRIFT (PIER PIT W
RSGEE CHECKED EXTENT
OF THE 1/4 TO 1/2" GAPS UNDE
THE MUD MAT ALONG NORTH
LIMIT OF LAY BACK EXCAV.
WITH 1/4" x 1" LATH PROBE
4'-6" MAX DEPTH OF THE GAPS
WAS NOTED. STEEL TAPE IT
PENETRATED UP TO 12' INTO
THE GAPS IN PROX OF EXTRA
(N-S) ℄ OF THE PIT W-B

FOR INFORMATION ONLY
RS-83-03
220

Signed Richard L Crosby Date 6-24-83

Reviewed by J.C. Wanzel Date 6-30-83

Distribution

BASE- E. STEEL
PGE- J. ANDERSON

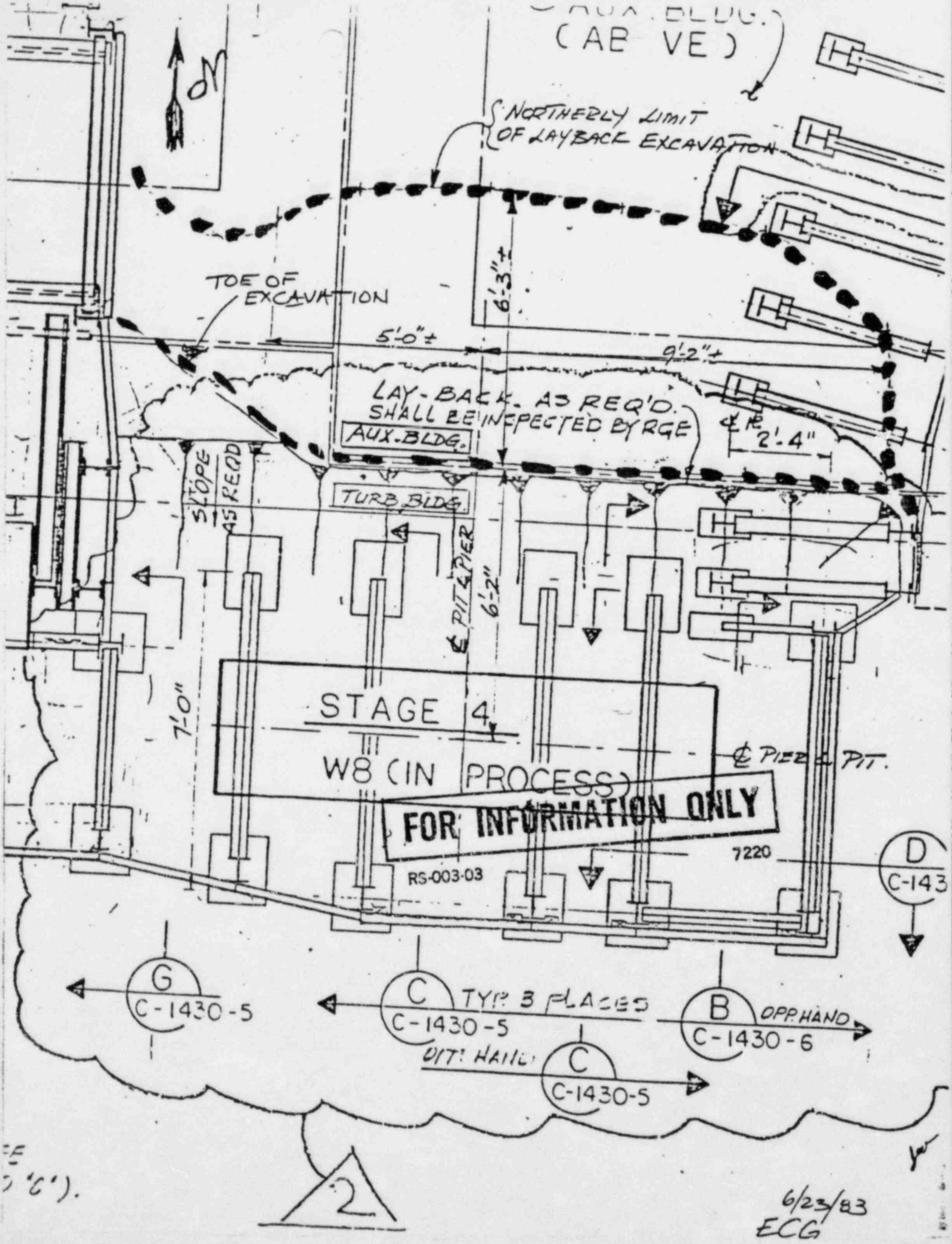
MIDLAND UNITS 1 AND 2 · JOB 7220
RESIDENT GEOTECHNICAL ENGINEER REPORT

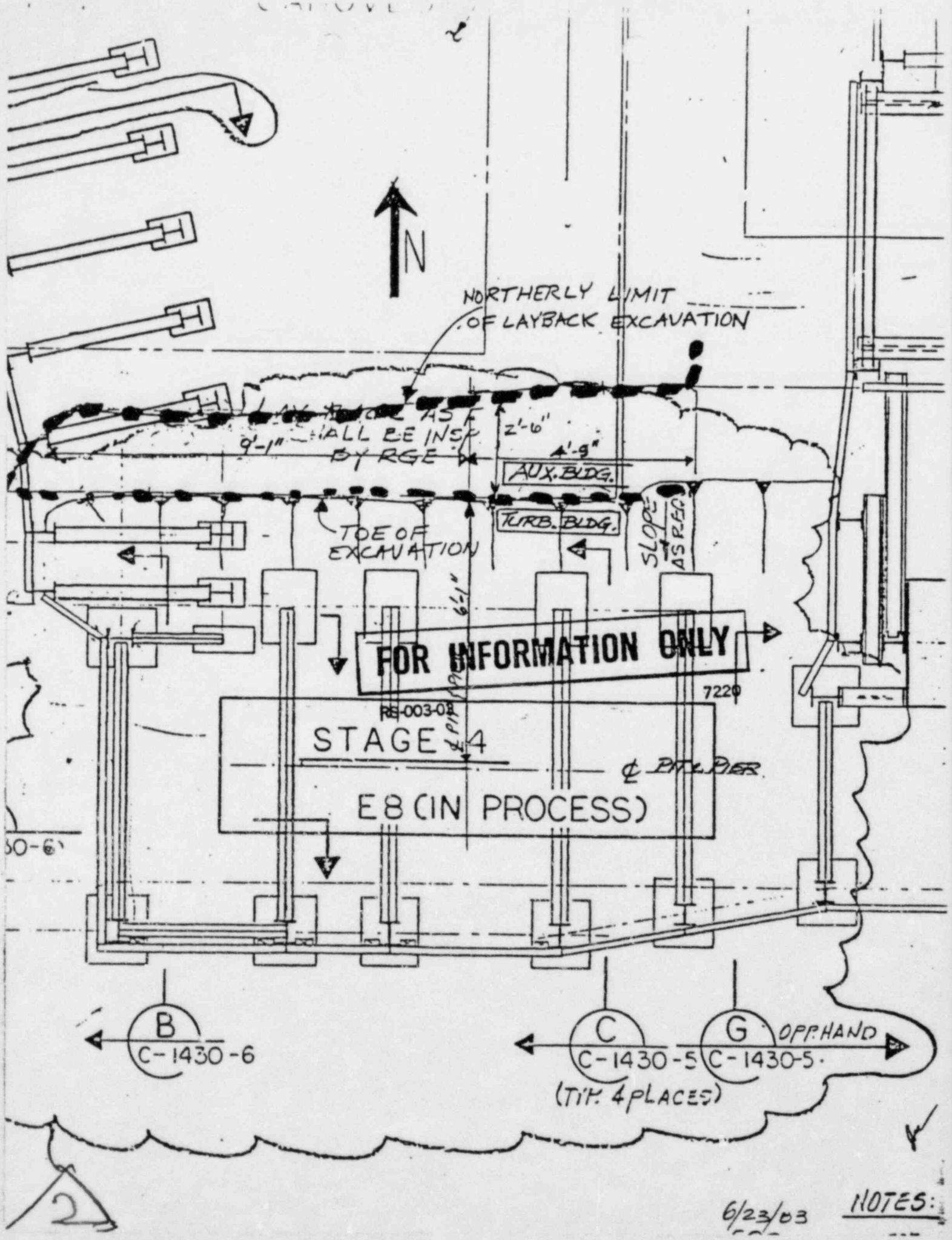
Date 6-23-83 Page 2 of 2
Shift DAY
A3

No.	Description	Remarks
(9)	MERGENTIME HAS BEEN DRILLING HOLES FOR HILTI BOLTS AT 1st & 2nd POST Rs (N-E CORNER OF THE DRIFT)	
(10)	NO ADDITIONAL EXCAVATION FOR THE (N-S) BULKHEAD IN PROGRESS TODAY	
	PIER E-8	
(11)	HAMMERHEAD SECTION OF PIT - HAS BEEN COVERED WITH PLYWOOD	
	ACCESS DRIFT TO PIER E-8 L EXCAVATION FOR (N-S) BULKHEAD	
(12)	NOTE: RGE DISCUSSED THE STATUS OF BULKHEAD EXCAVATION WITH RSGFEL MERGENTIME IT WAS AGREED TO PERMIT AN ADDITIONAL EXCAV AT (N-W) SECTION OF THE ACCESS DRIFT INCL BREAKING OUT OF 18" ± THICK FILL CONCRETE & MUD MAT IN (E-W) DIRECTION. THIS SPACE WAS REQUIRED TO INSTALL BULKHEAD Rs & POSTS (ROOM TO TORQUE THE BOLTS)	FOR INFORMATION ONLY 8303-03
	PIER E-10	
(13)	STRUCTURE SUPPORTED ON "ACTIVE JACKS" AT 110% OF SPEC LOAD. READINGS HAVE BEEN TAKEN AT 1 HRS TIME INTERVALS	
	PIER KC-11	
(14)	CURING OF THE UPPER TELL - TALE R DRYSPACE CONTINUED	
(15)	RGE (R COSBY & E GRAY) COMPLETED PREPARATION OF "AS BUILT" EXTENT OF EXCAVATIONS UNDER AUX BLDG ALONG THE NORTH SIDE OF ACCESS DRIFTS TO PIERS E-8 & W-9 TODAY. SKETCHES WERE PREPARED	
		(3) SHEETS OF SKETCHES ATTACHED TO THIS REPORT.

Signed Richard P. Cosby Date 6-24-83
Reviewed By J.C. Wanzel Date 6-30-83

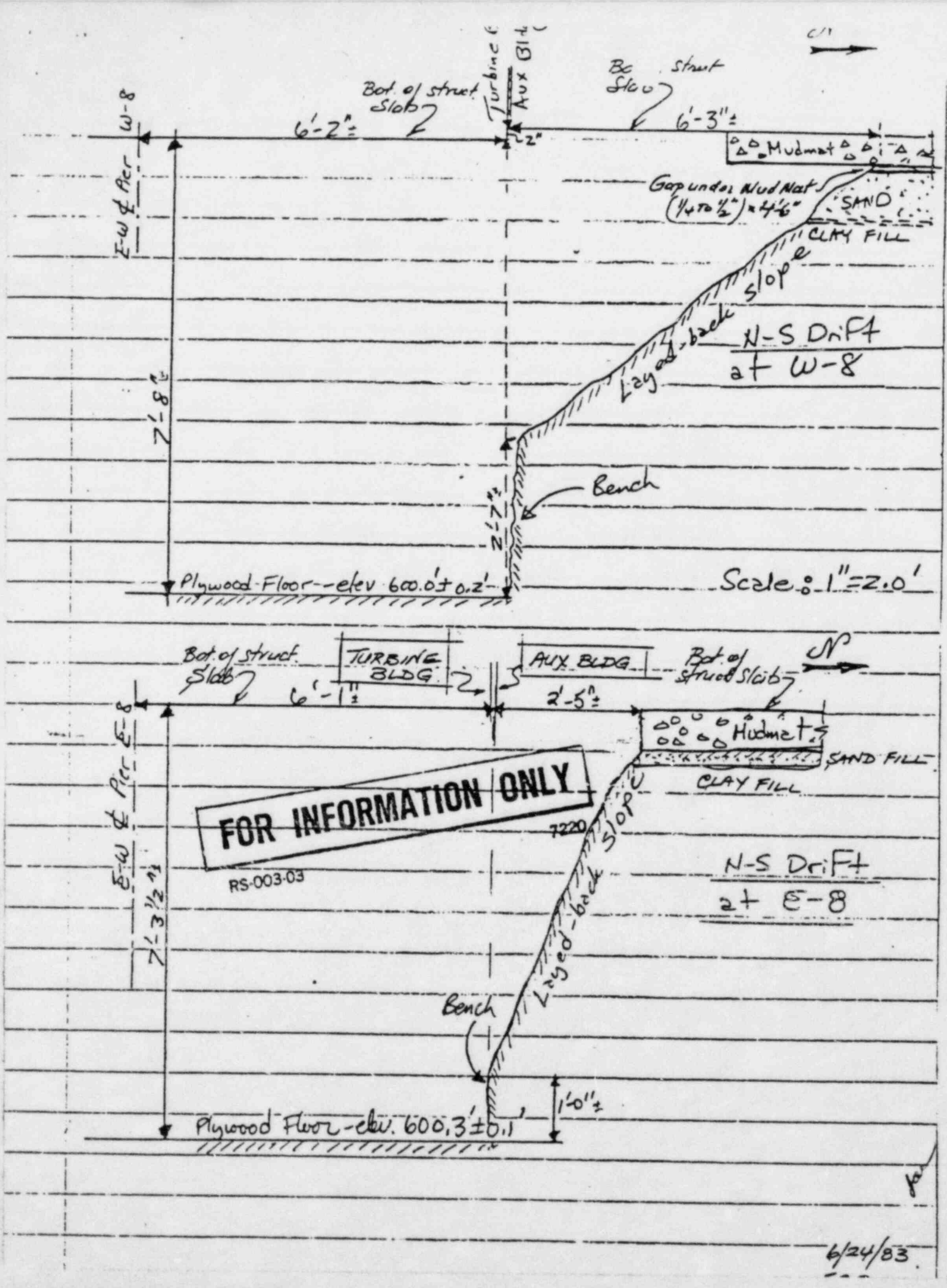
Distribution:
BAPE - E. STEEL
PGE - J. ANDERSON


(ABOVE)
NORTHERLY LIMIT OF LAYBACK EXCAVATION
TOE OF EXCAVATION
6'-3"±
5'-0"±
9'-2"±
LAY-BACK AS REQ'D. SHALL BE INSPECTED BY RGE
2'-4"
AUX. BLDG.
TURB. BLDG.
SLOPE AS REQ'D
℄ PIT & PIER
6'-2"
7'-0"
STAGE 4
W8 (IN PROCESS)
℄ PIER & PIT.
FOR INFORMATION ONLY
RS-003-03
7220
D
C-143
G
C-1430-5
C
TYP. 3 PLACES
C-1430-5
B
OPP HAND
C-1430-6
C
C-1430-5
2
6/23/83
ECG


N
NORTHERLY LIMIT OF LAYBACK EXCAVATION
ALL BE INSP BY RGE
9'-1"
2'-6"
4'-9"
AUX. BLDG.
TURB. BLDG.
TOE OF EXCAVATION
SLOPE AS REQ'D
6:1
FOR INFORMATION ONLY
7220
RE-003-03
STAGE 4
℄ PIT 2 PIER
E8 (IN PROCESS)
B
C-1430-6
C
C-1430-5
(TYP. 4 PLACES)
G OPP. HAND
C-1430-5

6/23/03

NOTES:


Bot. of struct. Slab
Turbine
Aux Bldg
Bc Slab
Struct
W-8
6'-2"±
6'-3"±
2"
Mudmat
Gap under Mud Mat (1/4 to 1/2") x 4'6"
SAND
CLAY FILL
E-W ℄ Pier
7'-8"±
Slope
Layed-back
N-S Drift at W-8
2'-7"±
Bench
Plywood Floor -- elev 600.0' ± 0.2'
Scale: 1" = 2.0'
Bot. of struct. Slab
TURBINE BLDG.
AUX. BLDG.
Bot. of struct Slab
N
6'-1"±
2'-5"±
Mudmat
SAND FILL
CLAY FILL
E-W ℄ Pier E-8
FOR INFORMATION ONLY
7220
RS-003-03
7'-3 1/2"±
Slope
Layed-back
N-S Drift at E-8
Bench
1'-0"±
Plywood Floor - elev. 600.3' ± 0.1'
6/24/83

MIDLAND UNITS 1 AND 2 - JOB 7220
RESIDENT GEOTECHNICAL ENGINEER REPORT

Date 6/26/83
Shift NIGHT - E
AB

No.	Description	Remarks
	West Shaft	
	Pier KC-2	FOR INFORMATION ONLY
1.	No activity	
	Pier W8	
1.	No activity	
	Pier W9	
1.	"Non-routine" repacking at 125% S.L. Continued. As of 12:56 a.m. pier top movement was 13 mil in last 48 hours. 4 hour readings continued.	
1.	Pier W10 Started placing jacks.	
1.	Filled void north of layback area * 180 gals of neat cement grout (3/4 water : 1) were used. grout pressures ranged from approx. 20 to 80psi Signed QC IR and stated that RGE concurred with F.E. grouting operation was acceptable.	* See sketch attached.
	QC hold on bearing Pl on knee brace* of 2nd set	* Pl improperly shimmed on QC tag.
	East Shaft	
	Pier KC-11	
1.	Started placing jacks on top of pier.	
	Pier E8	
1.	No activity	
	Pier E10	
1.	110% S.L. maintained. 8 hour readings Continued As of 12:35 a.m. movement was 2 mils in last 24 hours.	
	N-S Bulkhead North of E8	
1.	QC hold on bearing Pl on 2nd post due to gap between Pl & Str. Conc. wider than 1/16".	

Signed Alan Tang Date 6/27/83

Reviewed by Date

Distribution
BAPE- E. CLERK
PGE- J. ANDERS

NCP 15.000
Rev. 8

ATTACHMENT C
To NCP 15.000

FOR INFORMATION ONLY

GROUT PLACEMENT PLAN

Prepared By: D F Raeder (MFE)

Approved By: Terrell Ellis (RSG FE)

W D (RGE)

Location: 11' NORTH OF WEST 8.

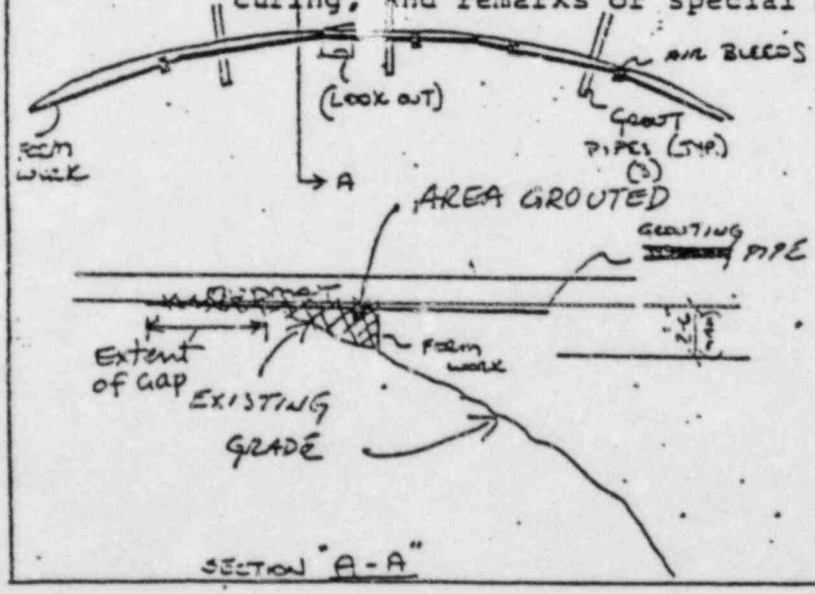
Plate Orientation: N/A

Type of Grout: CEMENT

Method of Grout Placement:
- ☐ Gravity
- ☐ Pressure - Hand Pump
- ☒ Pressure - Mechanically Driven Pump

Maximum Grout Pressure: 150 -- (For pressure grout placement with a mechanically driven pump only.)

Sketch: (Indicate plate orientation, location of forms, location of vent holes and/or vent pipes, grouting sequence to avoid air entrapment, location of grout pipes, edge treatment for curing, and remarks or special notes.)



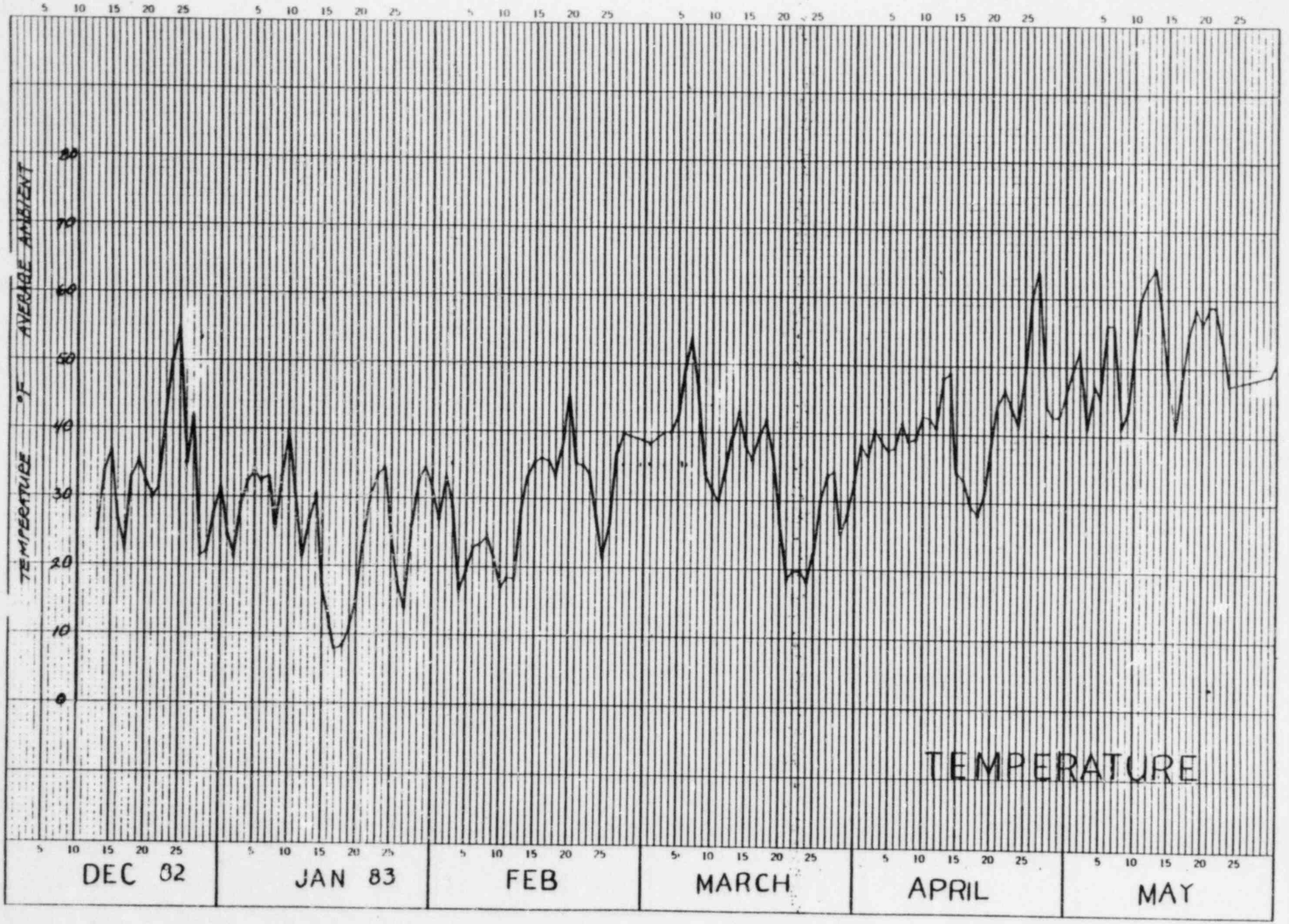
FORM CURE

NOTE:
1. PIPE LOCATIONS MAY VARY DUE TO RESISTANCE WHILE BEING PLACED.
2. AIR BLEEDS AS NECESSARY
3. OBSERVATION PORTS AS REQUIRED.
4. FORMWORK MAY VARY DEPENDING ON SOIL CONDITIONS (ACTUAL).
5. MAX. SPACING OF GROUT TUBE 10'.

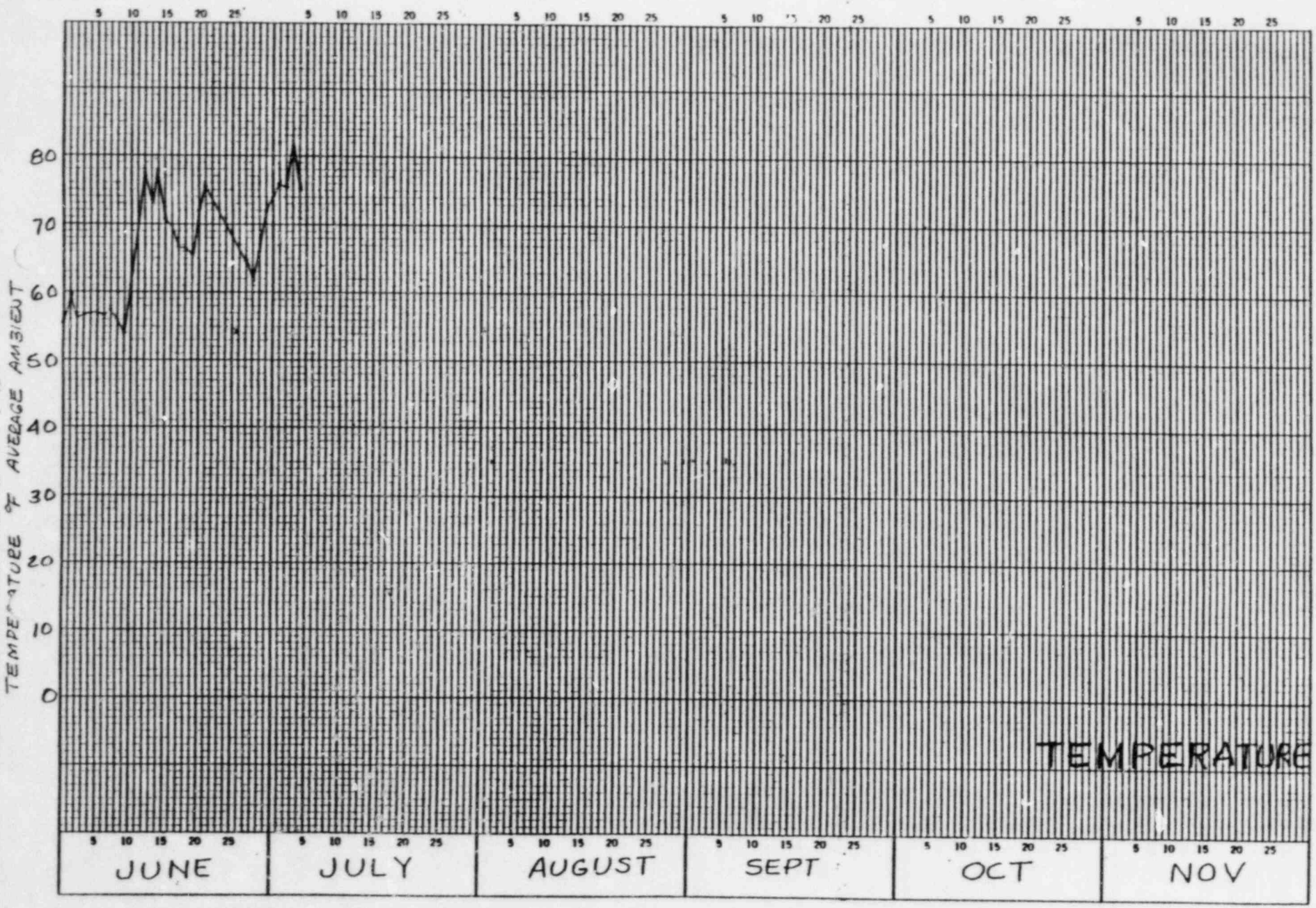
AREA GROUTED.

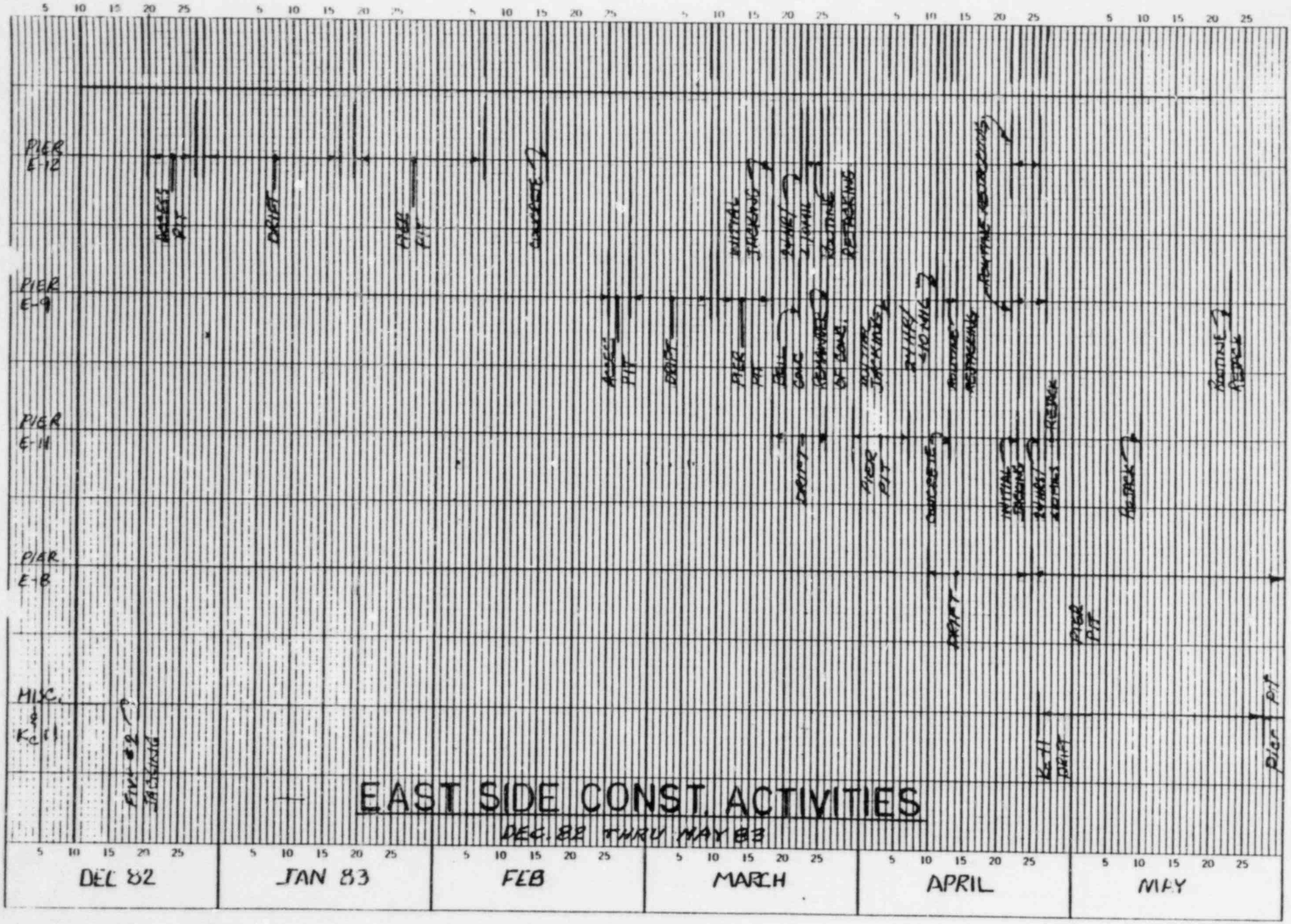
F7220-C195-28-7 (2)

ATTACHMENT FOR DAILY REPORT 6/26/83
NIGHT SHIFT (E.)



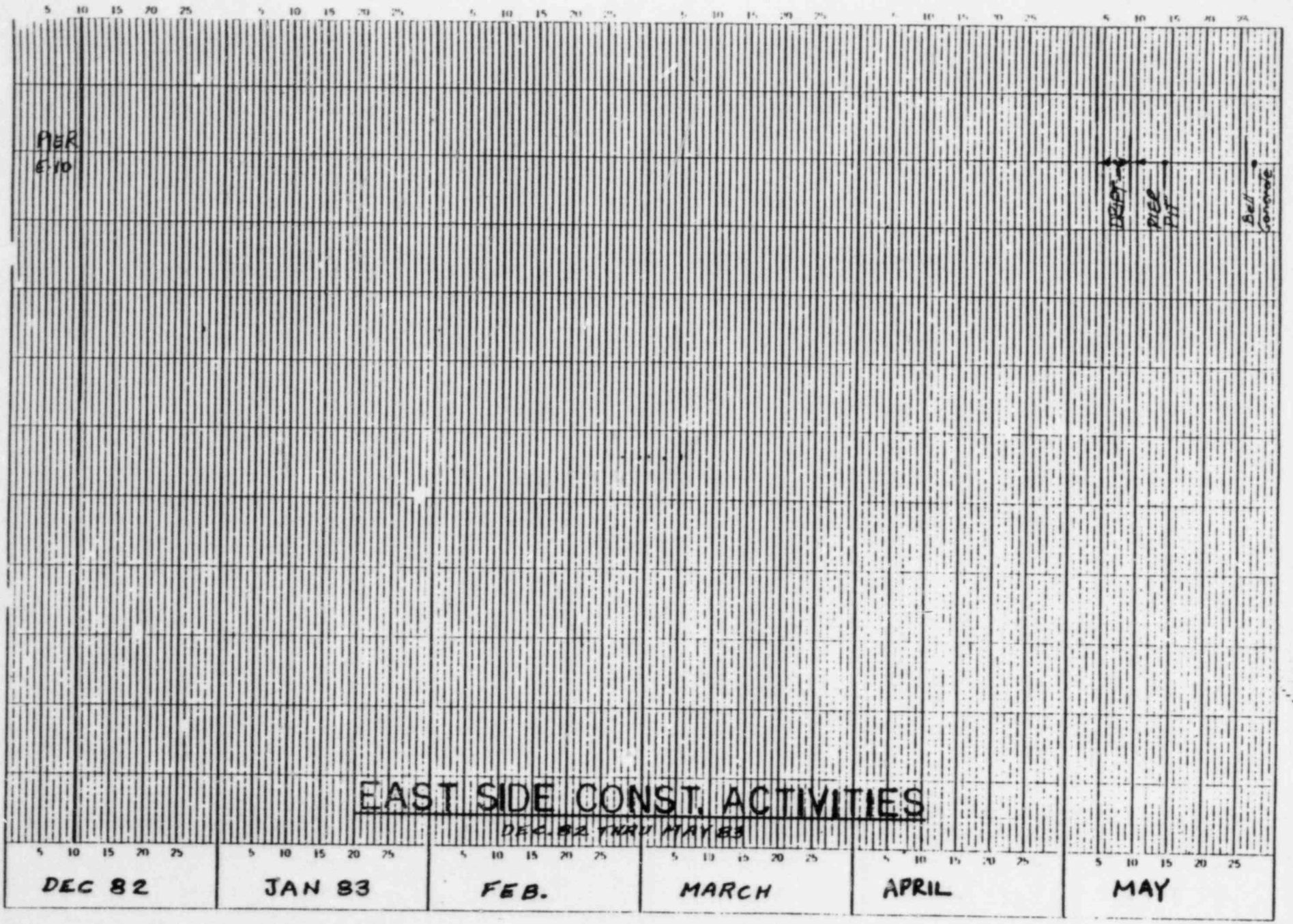
K·E 6 MONTHS BY DAYS X 120 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 2610





EAST SIDE CONST. ACTIVITIES

DEC. 82 THRU MAY 83

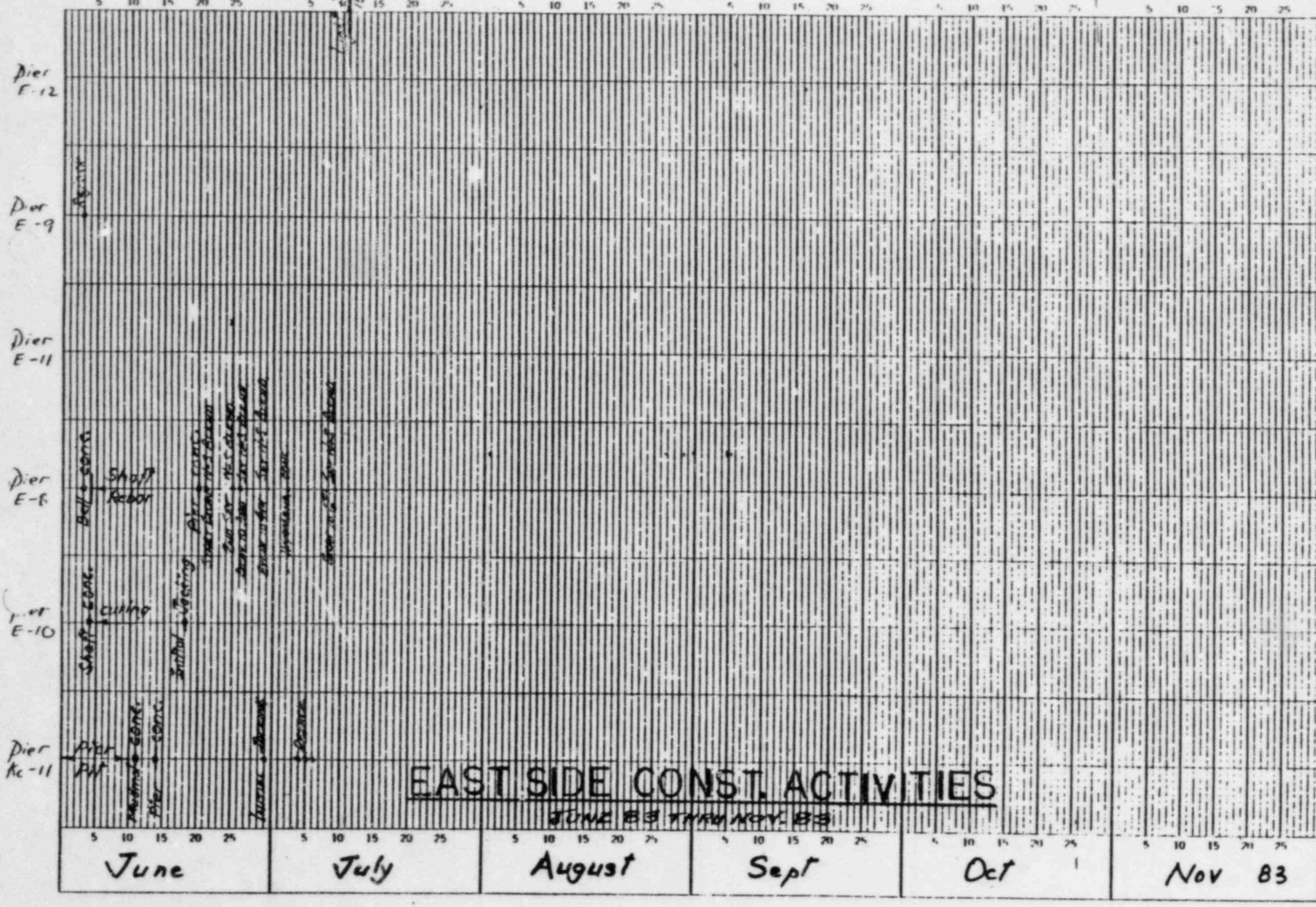


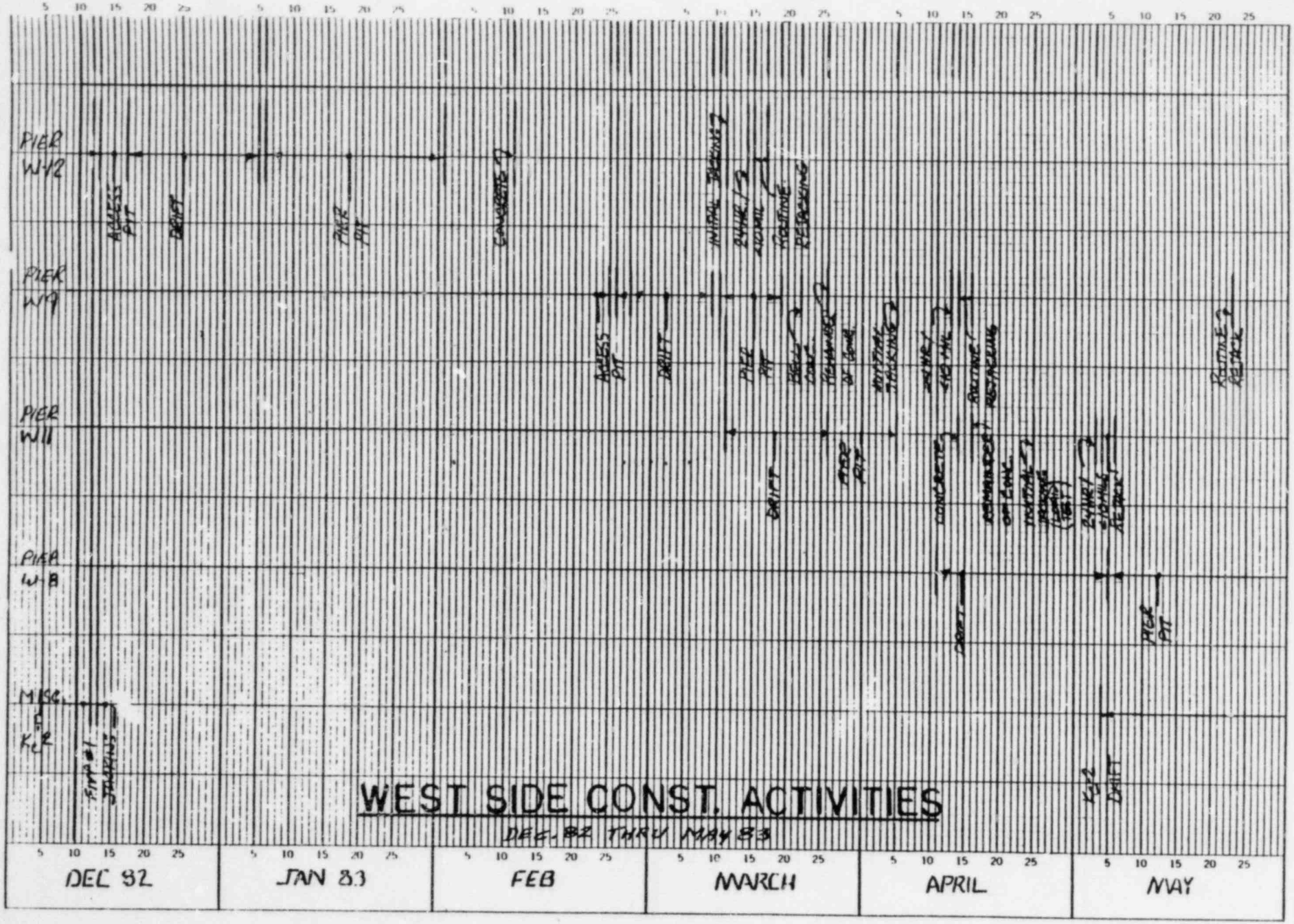
EAST SIDE CONST. ACTIVITIES

DEC. 82 THRU MAY 83

6 MONTHS BY DAYS X 120 DIVISIONS

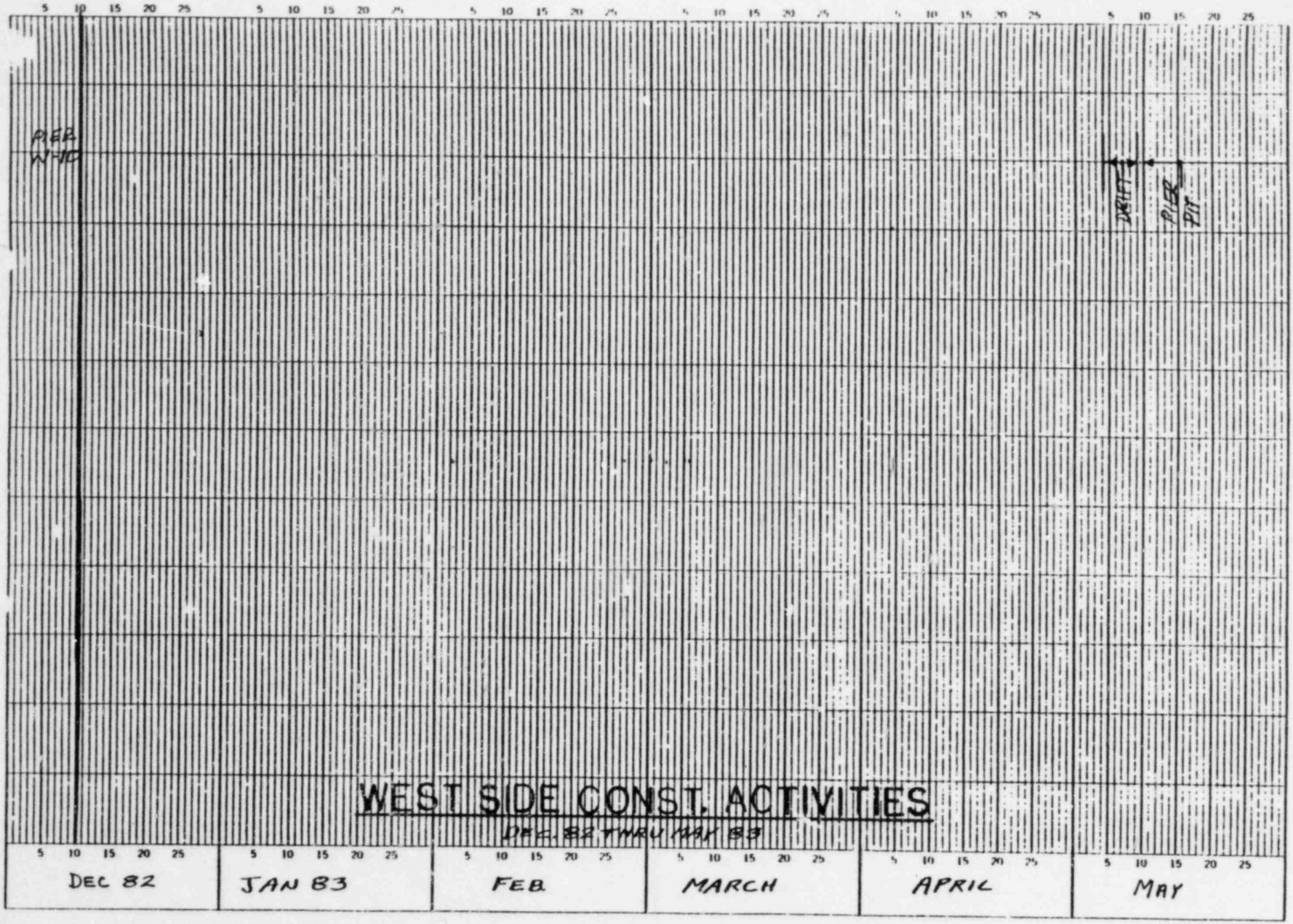
46 2610

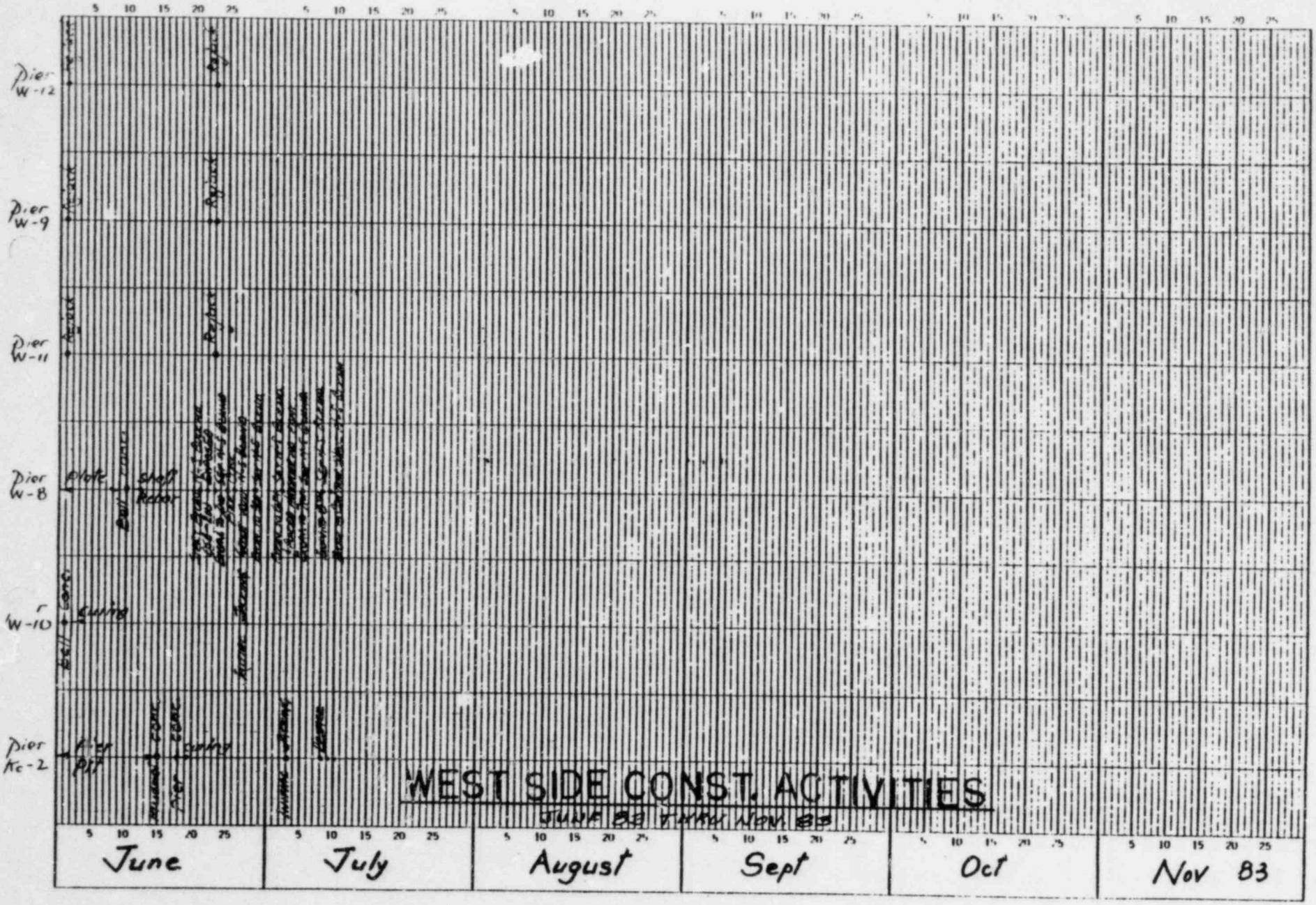


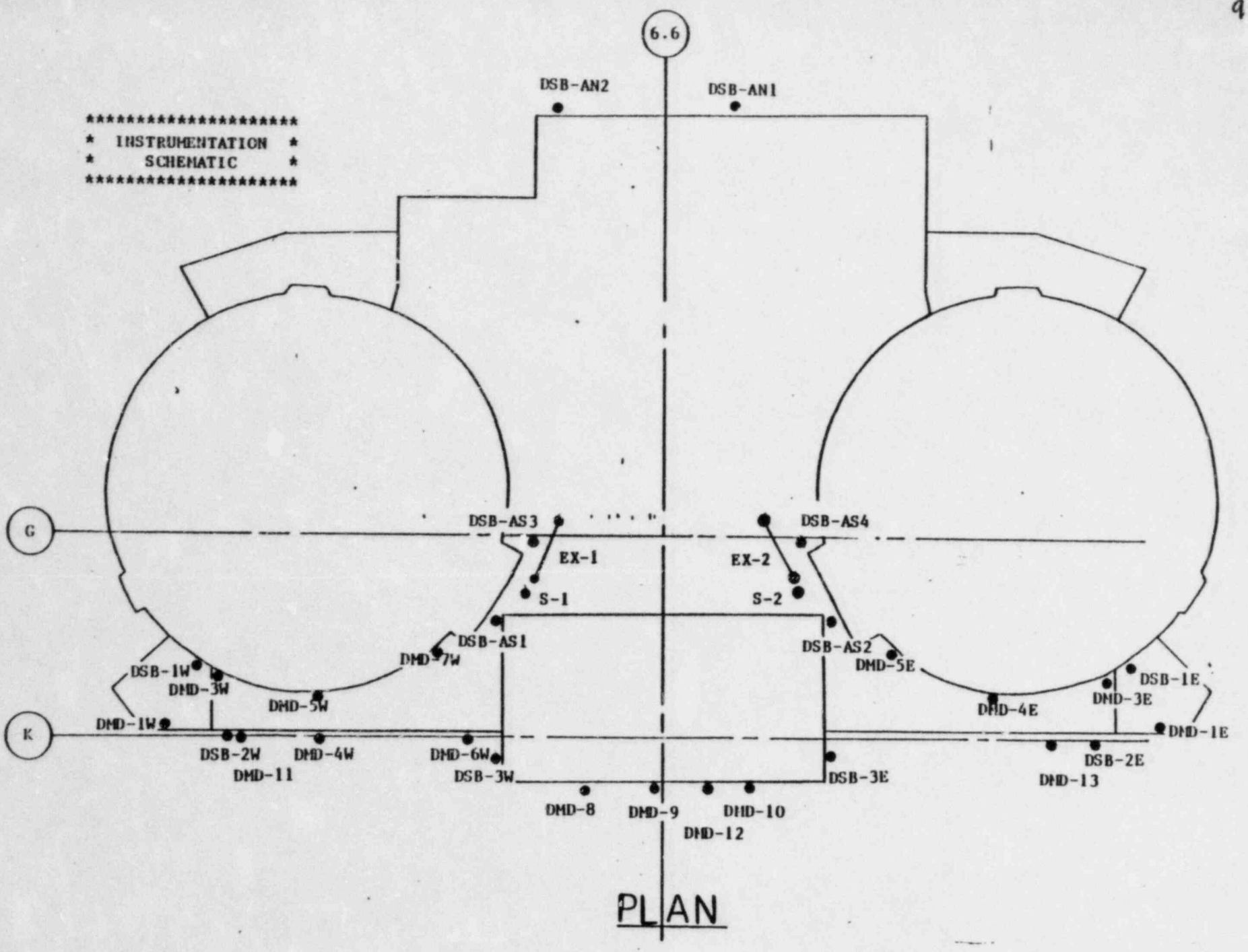

PIER W12
PIER W10
PIER W11
PIER W-8
MISC.
ACCESS PIT
DRIFT
PIER PIT
CONCRETE
INITIAL BACKING
BACKING
RETACKING
ACCESS PIT
DRIFT
PIER PIT
MOISTURE TREATMENT
CONCRETE
RETACKING
PIER PIT
RETACK
DRIFT
WEST SIDE CONST. ACTIVITIES
DEC. 82 THRU MAY 83
DEC 82
JAN 83
FEB
MARCH
APRIL
MAY

46 2010

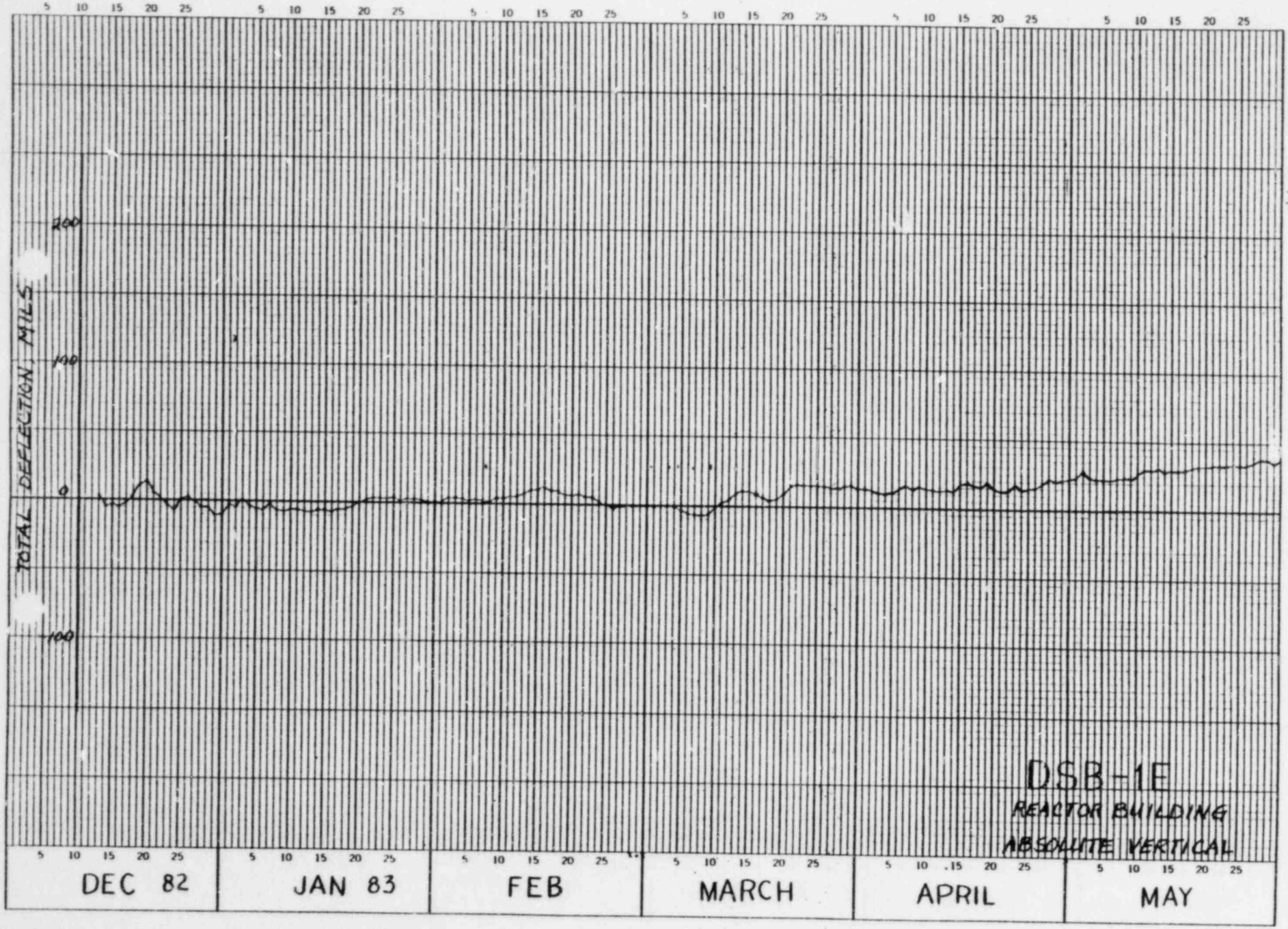
7

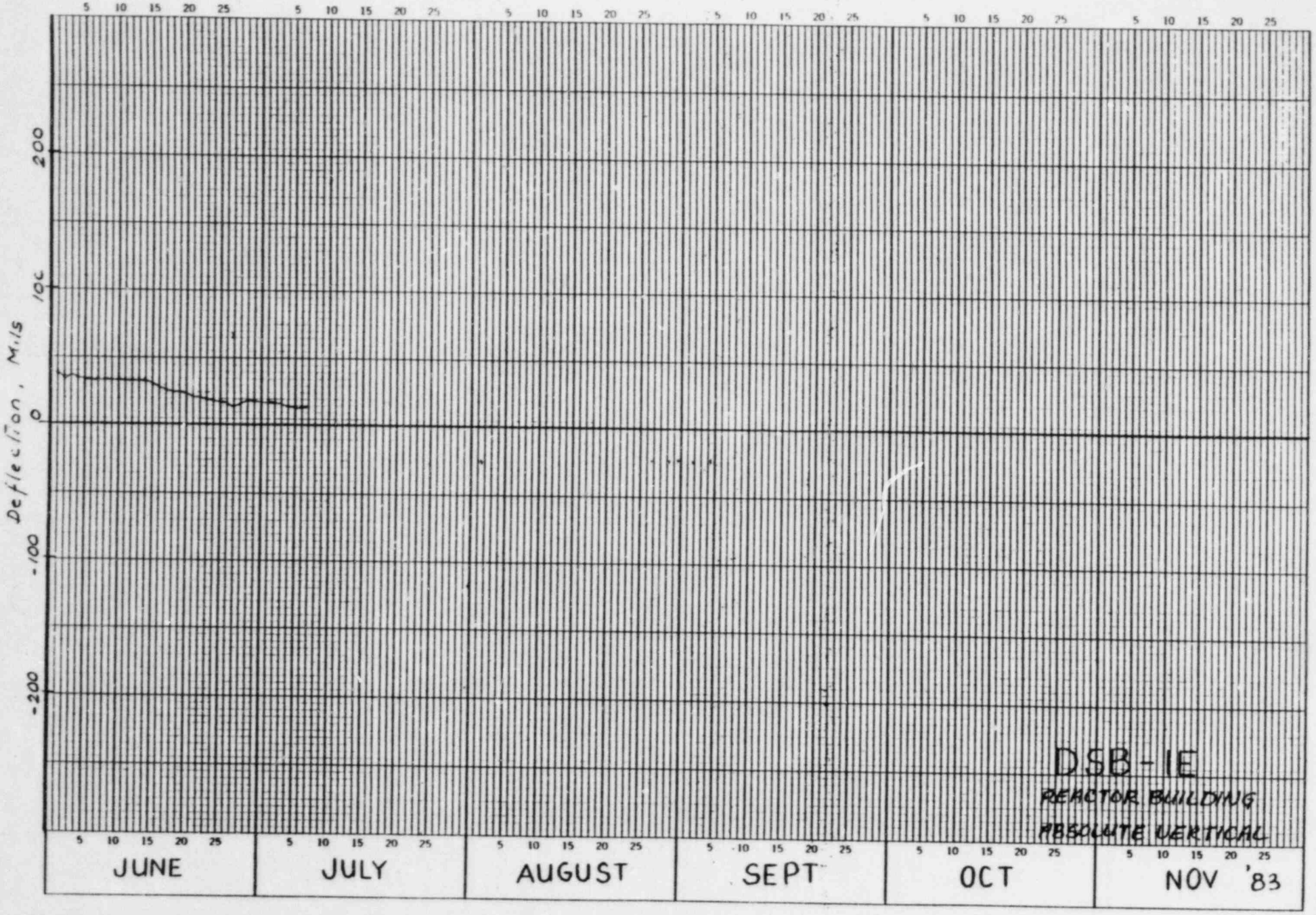


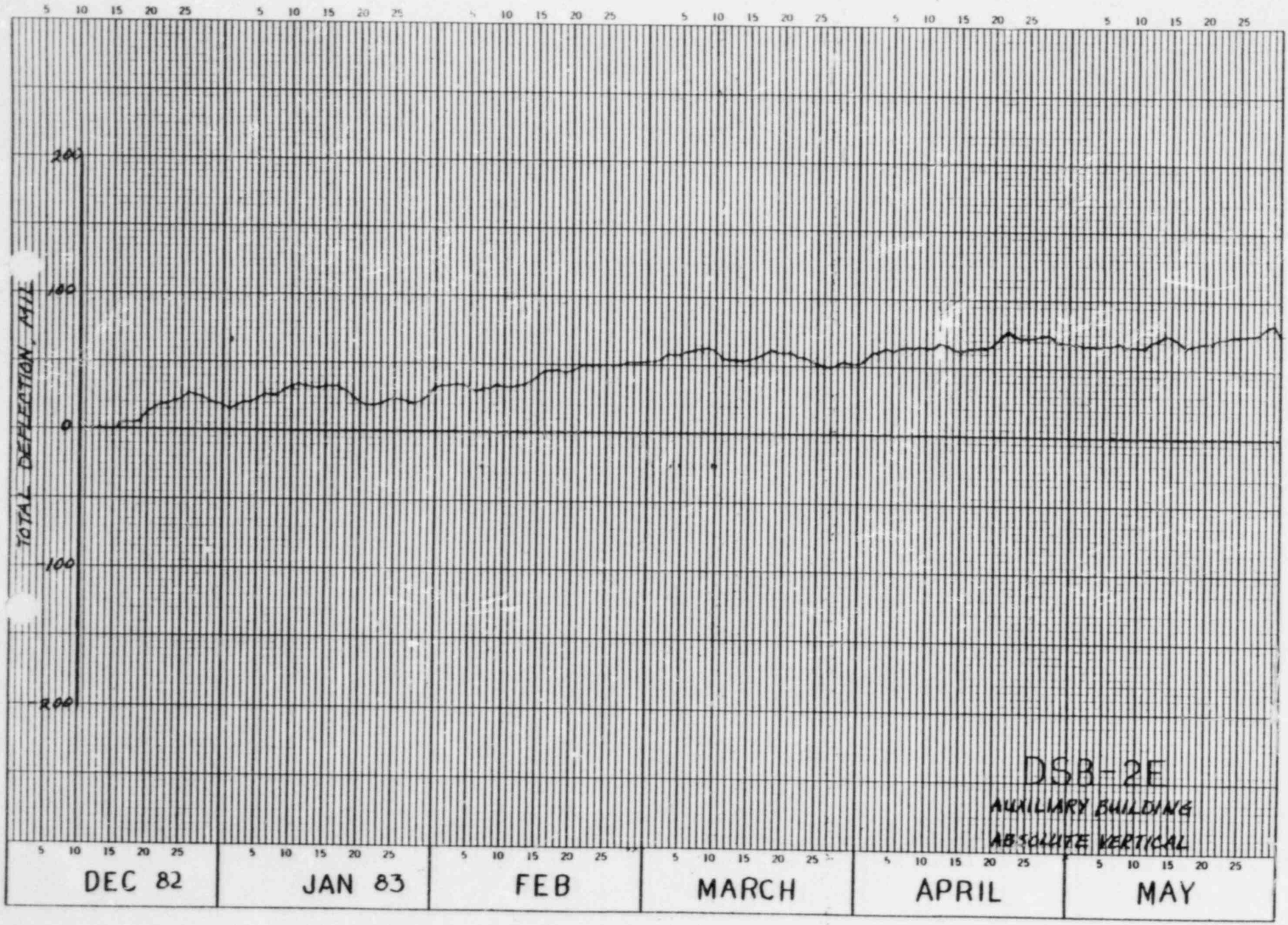



6.6
DSB-AN2
DSB-AN1
****
* INSTRUMENTATION *
* SCHEMATIC *
****
G
K
DSB-AS3
DSB-AS4
EX-1
EX-2
S-1
S-2
DSB-AS1
DSB-AS2
DMD-7W
DMD-5E
DSB-1W
DMD-3W
DMD-5W
DMD-1W
DSB-2W
DMD-4W
DMD-11
DMD-6W
DSB-3W
DMD-8
DMD-9
DMD-10
DMD-12
DSB-3E
DMD-4E
DSB-1E
DMD-3E
DMD-1E
DSB-2E
DMD-13

PLAN

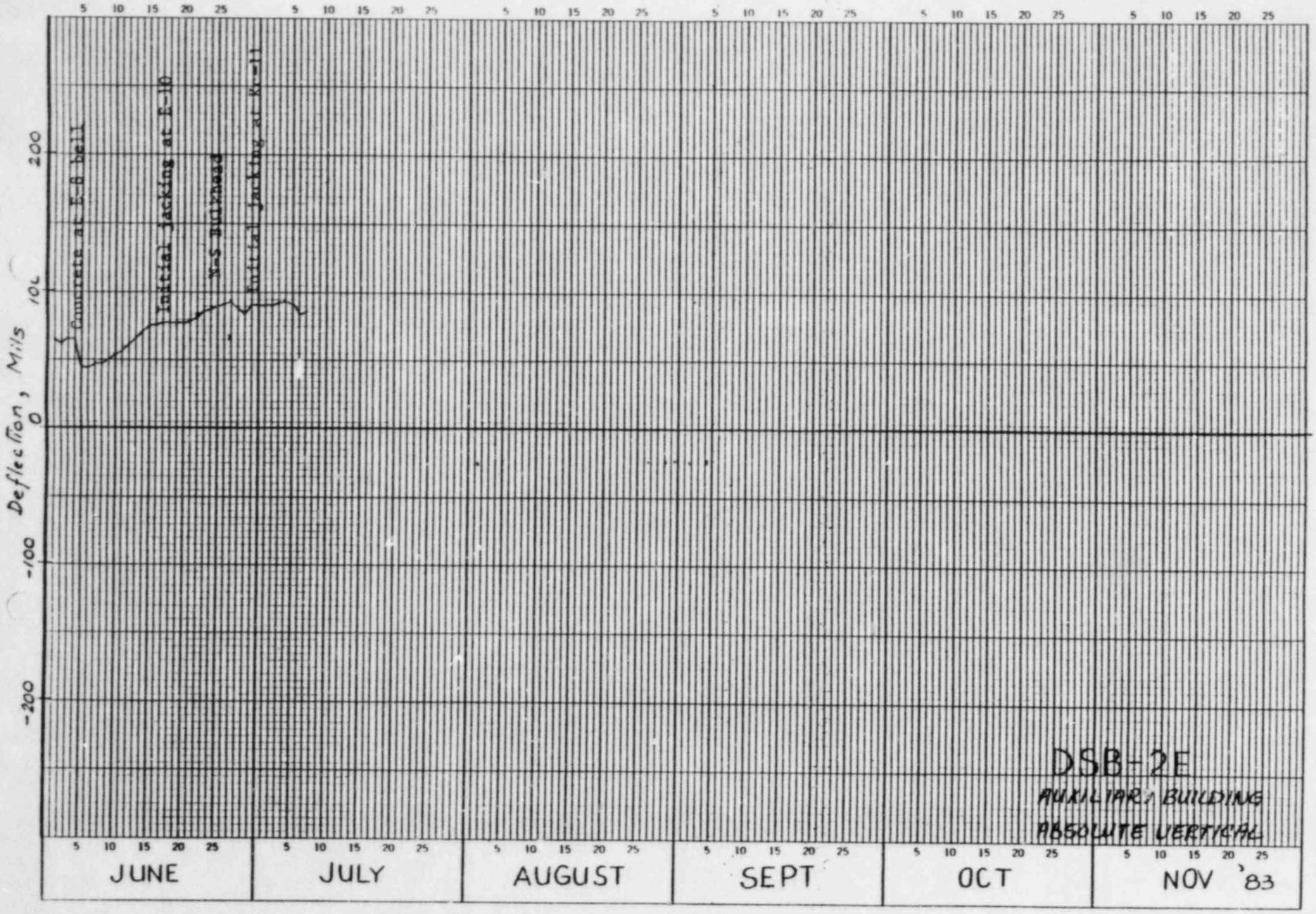

TOTAL DEFLECTION MILS
200
100
0
-100
DSB-1E
REACTOR BUILDING
ABSOLUTE VERTICAL
DEC 82
JAN 83
FEB
MARCH
APRIL
MAY


Deflection, Mils
200
100
0
-100
-200
5 10 15 20 25
JUNE
JULY
AUGUST
SEPT
OCT
NOV '83
DSB-1E
REACTOR BUILDING
ABSOLUTE VERTICAL


5 10 15 20 25
TOTAL DEFLECTION, MIL
200
100
0
-100
-200
DEC 82
JAN 83
FEB
MARCH
APRIL
MAY
DSB-2E
AUXILIARY BUILDING
ABSOLUTE VERTICAL

46 2610

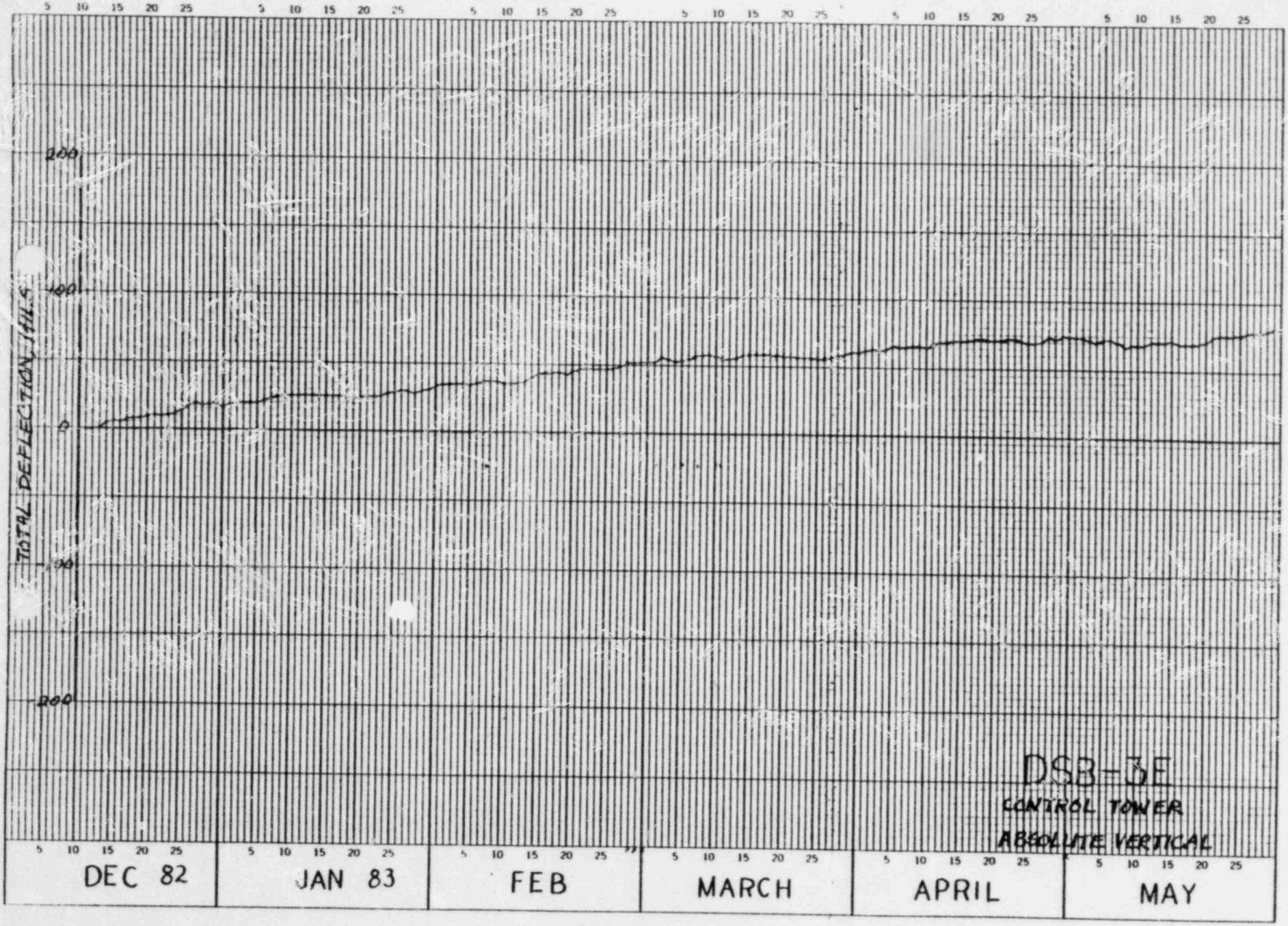
13



K&E 6 MONTHS BY DAYS X 120 DIVISIONS
KEUFFEL & ESSER CO MADE IN U.S.A.

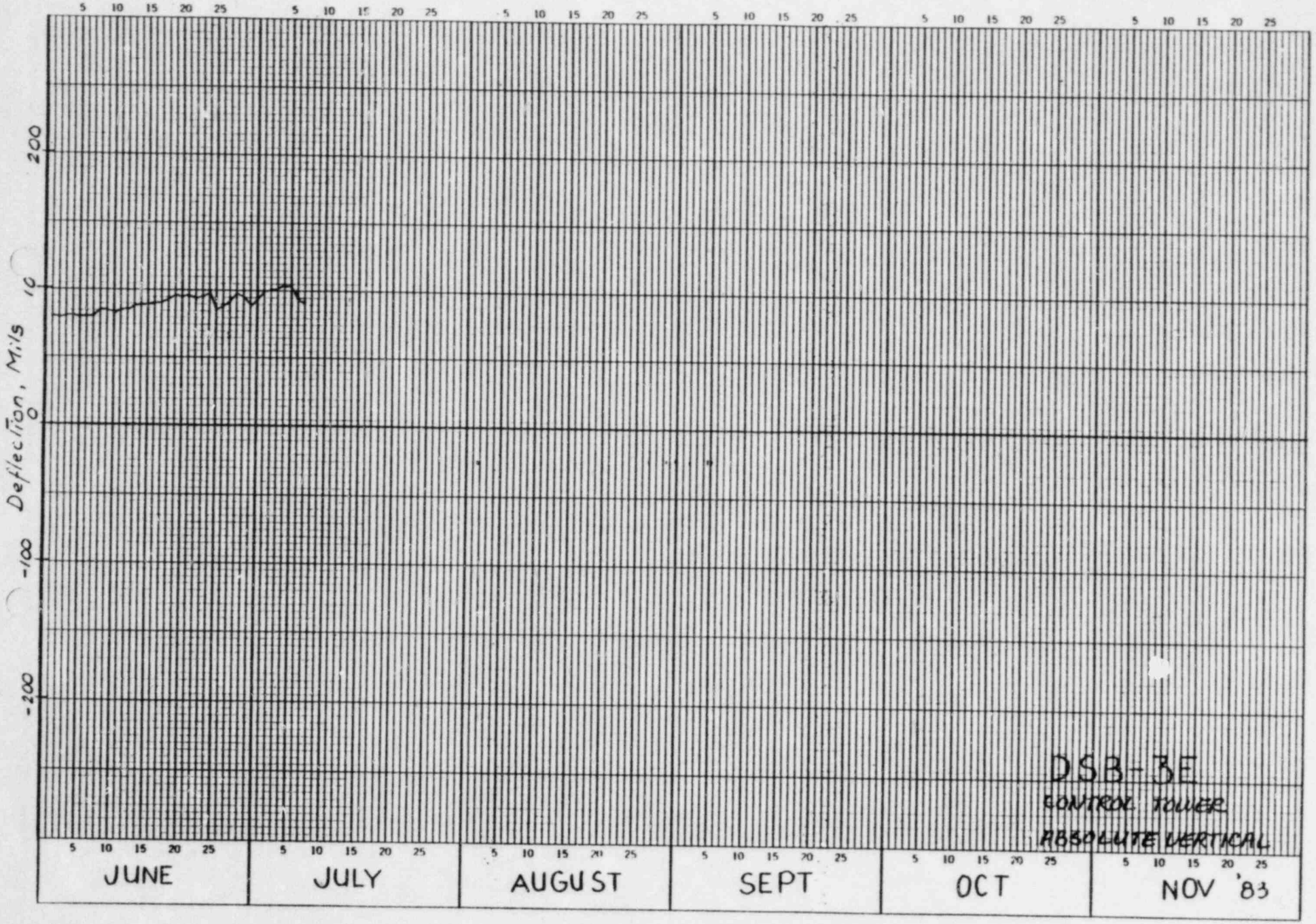
46 2610

14



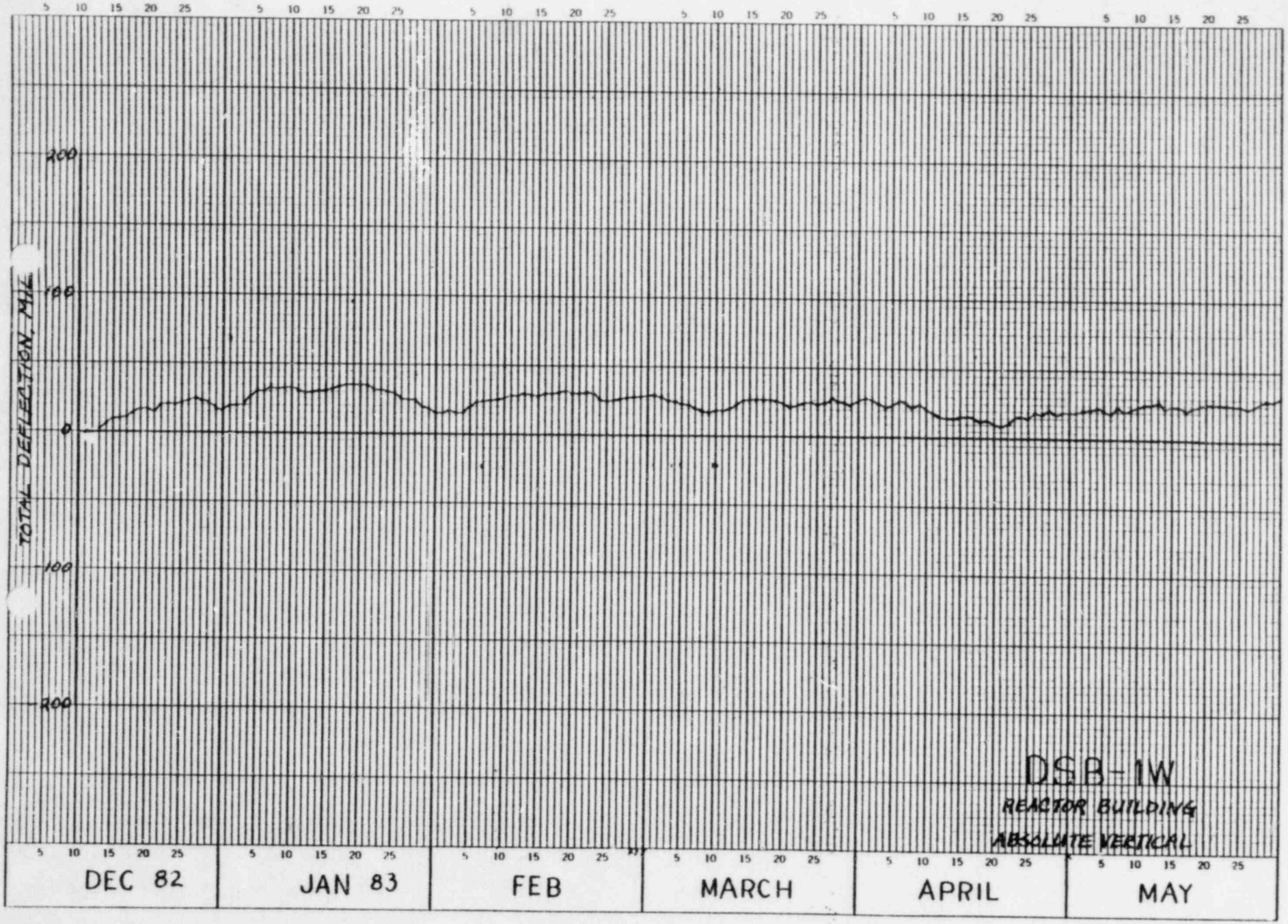
46 2610

19



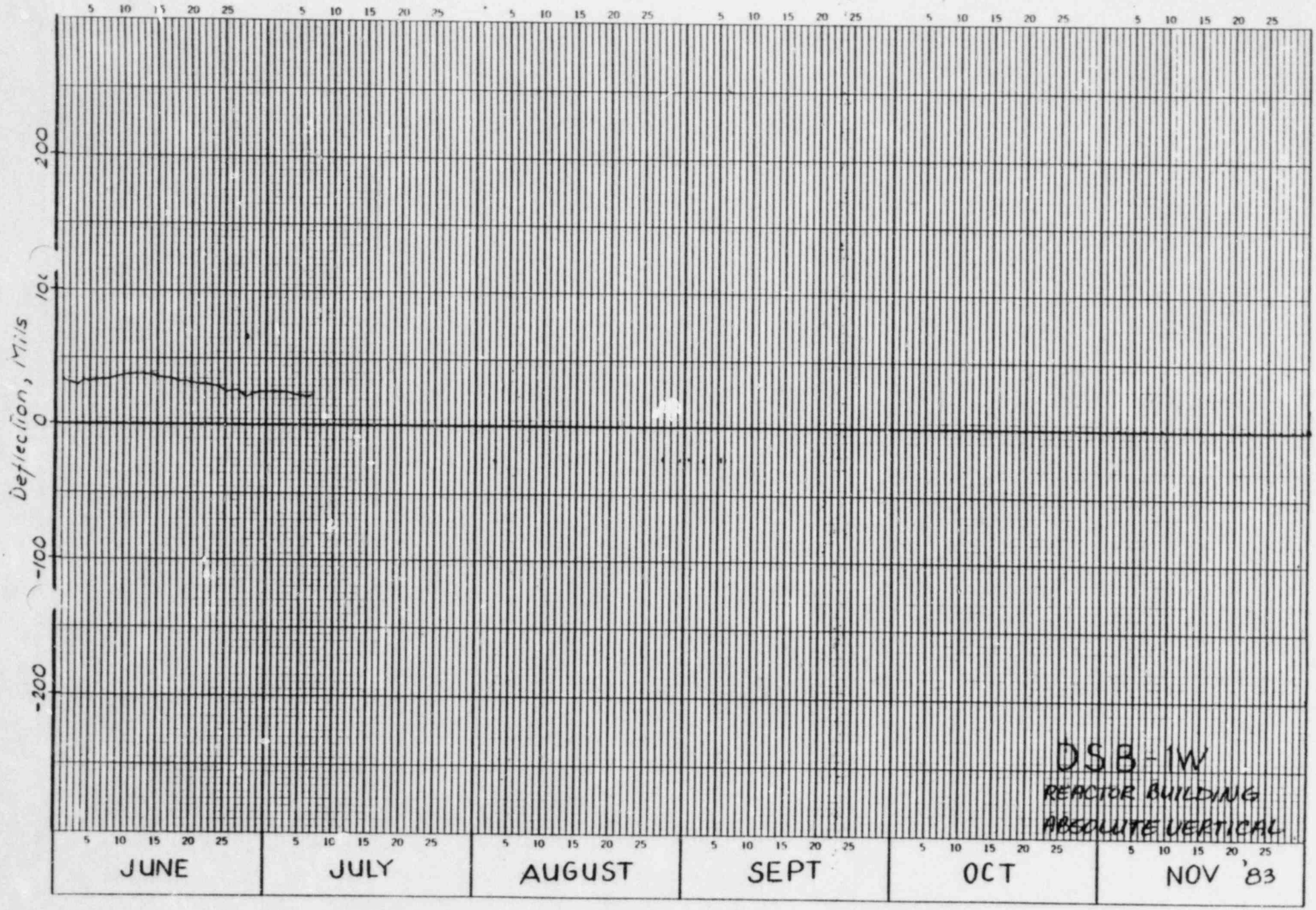
K·E 6 MONTHS BY DAYS X 120 DIVISIONS
KEUFFEL & ESSER CO MADE IN U.S.A.

46 2610



46 2610

17



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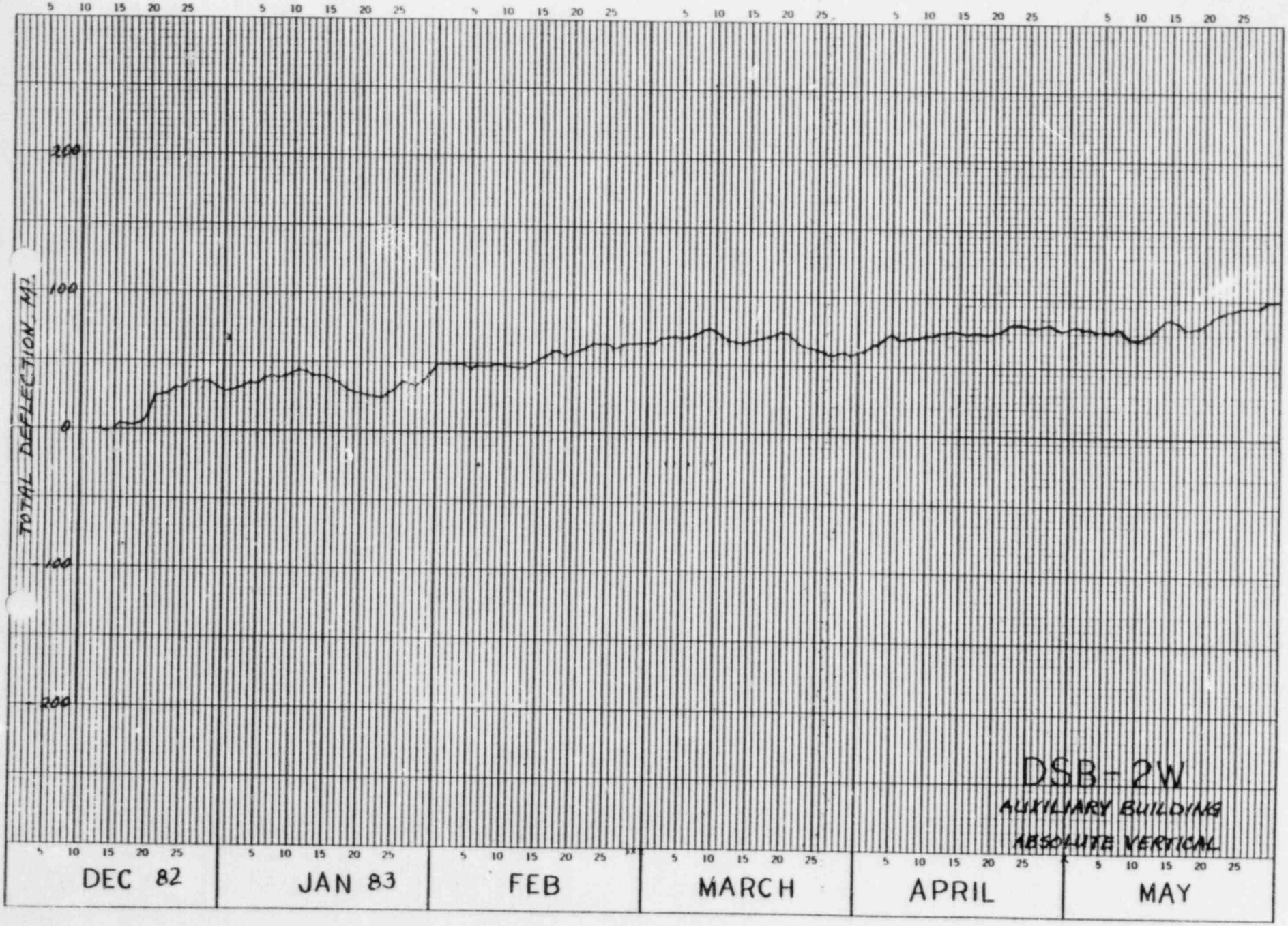
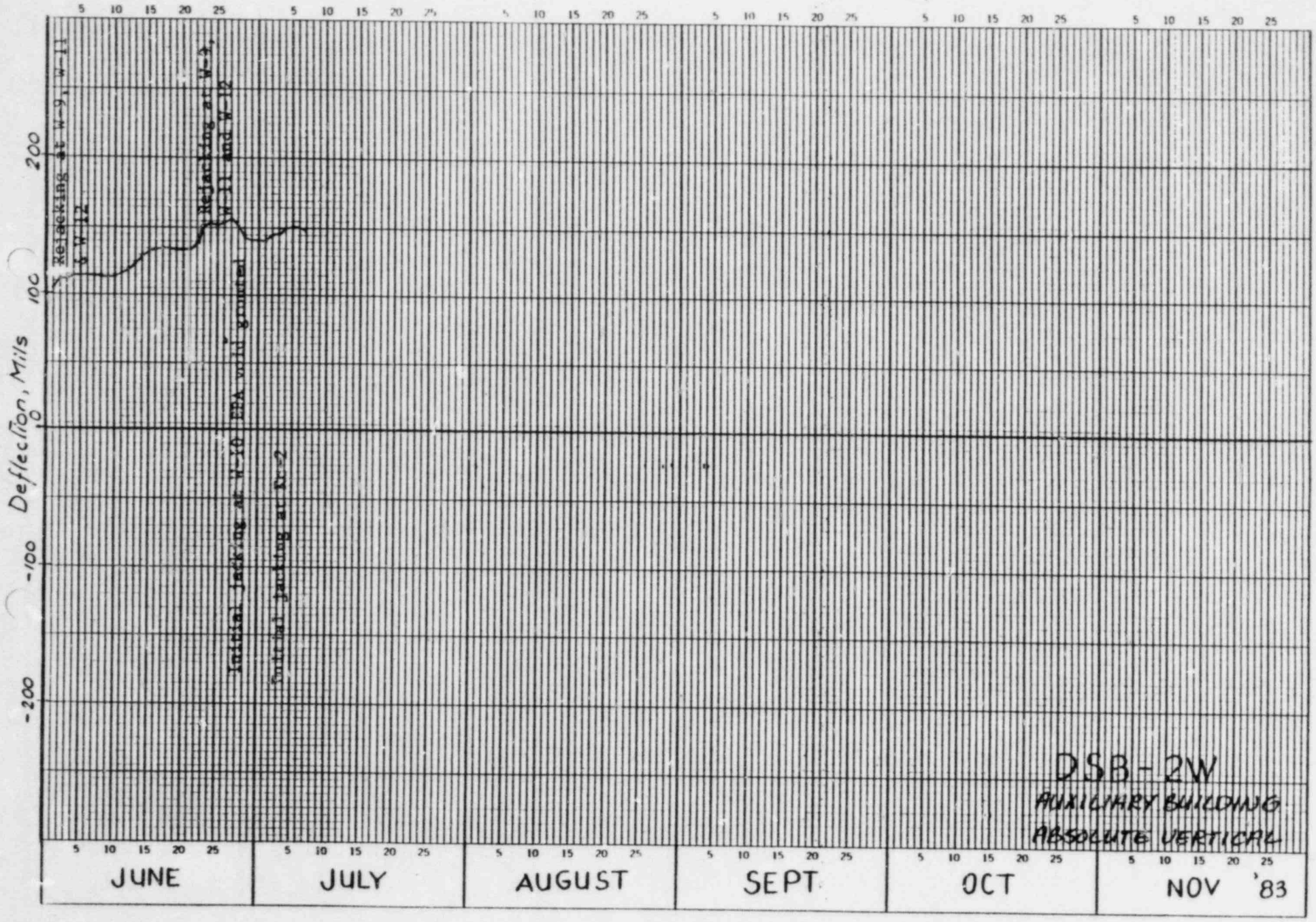
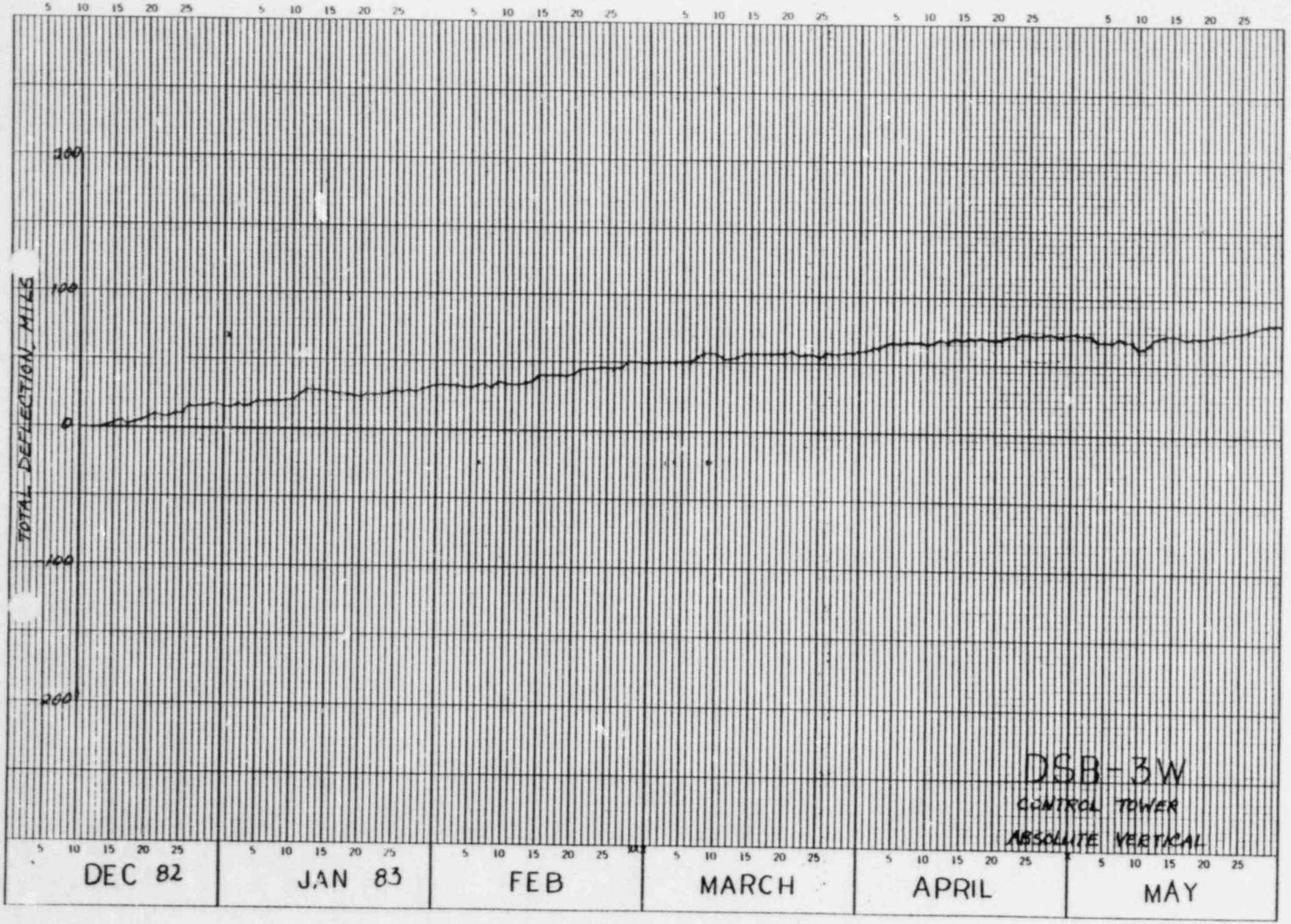



Deflection, Mils
200
100
0
-100
-200
5 Relacking at W-9, W-11 & W-12
Relacking at W-9, W-11 and W-12
Initial jacking at W-10 EBA weld grounded
Initial jacking at W-2
DSB-2W
AUXILIARY BUILDING
ABSOLUTE VERTICAL
JUNE
JULY
AUGUST
SEPT
OCT
NOV '83

K•E 6 MONTHS BY DAYS X 120 DIVISIONS
KEUFFEL & ESSER CO.

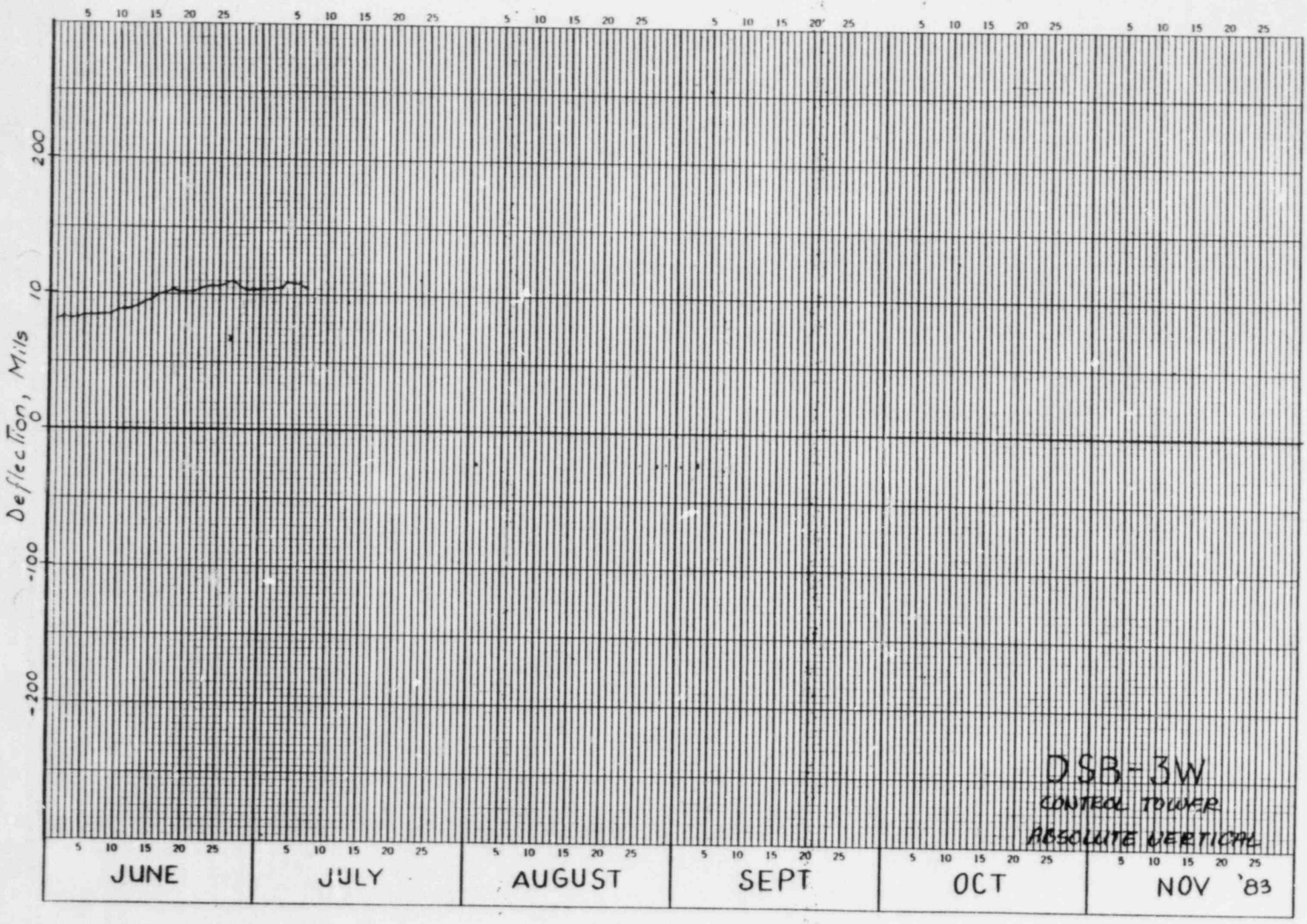
46 2610

20



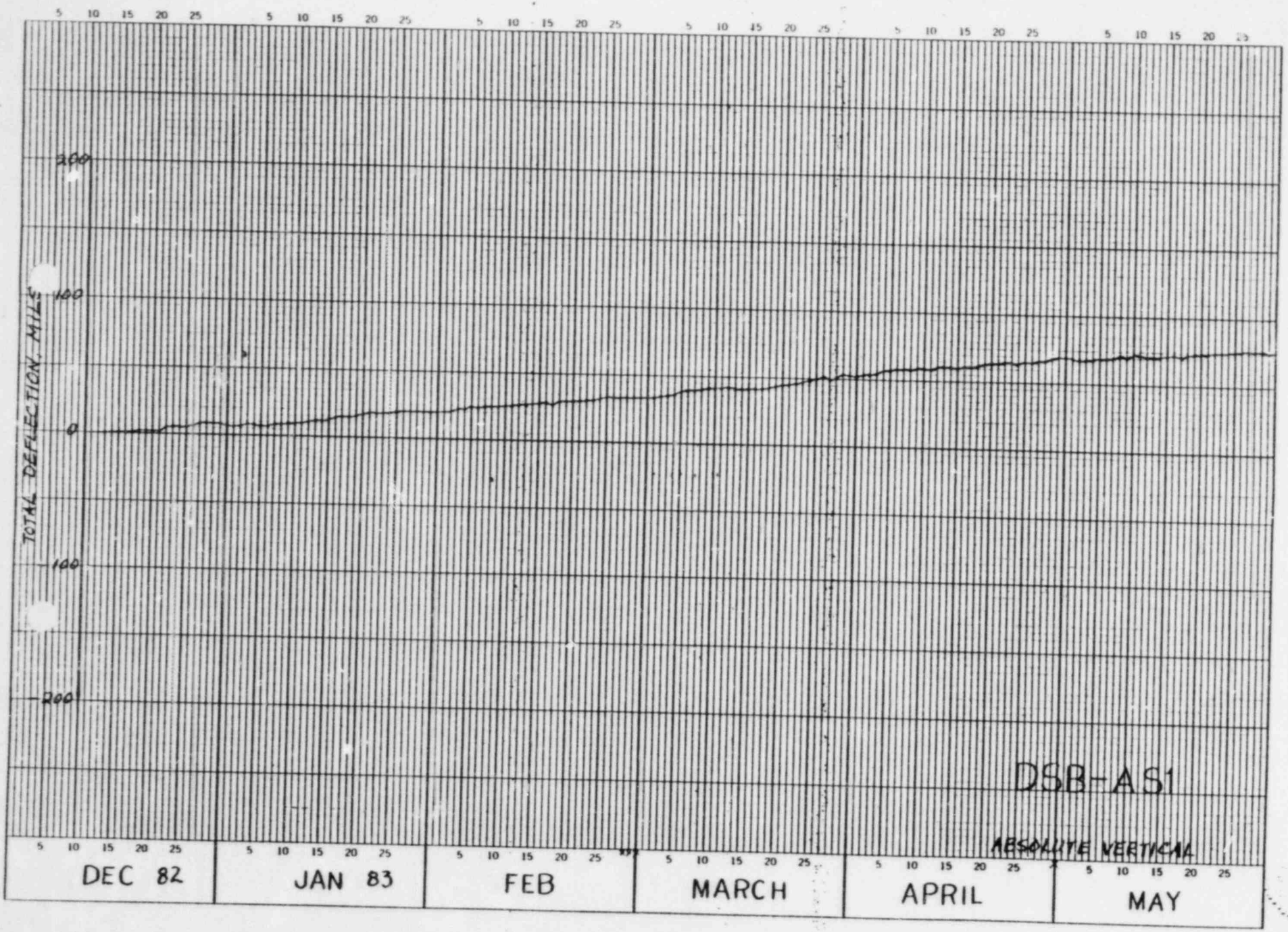
46 2610

21



K·E 6 MONTHS BY DAYS X 120 DIVISIONS
KEUFFEL & ESSER CO

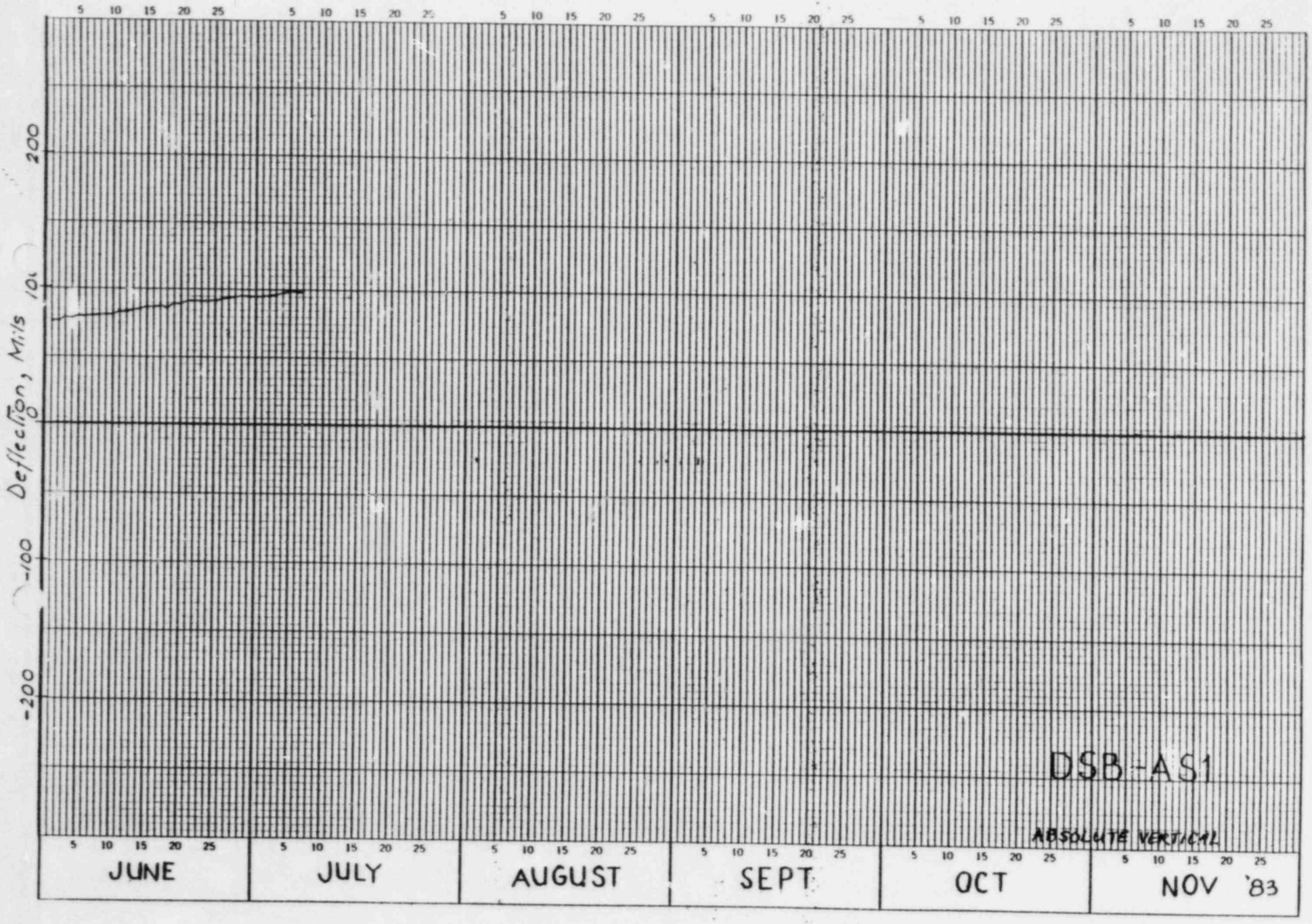
46 2610



K·E 6 MONTHS BY DAYS X 120 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

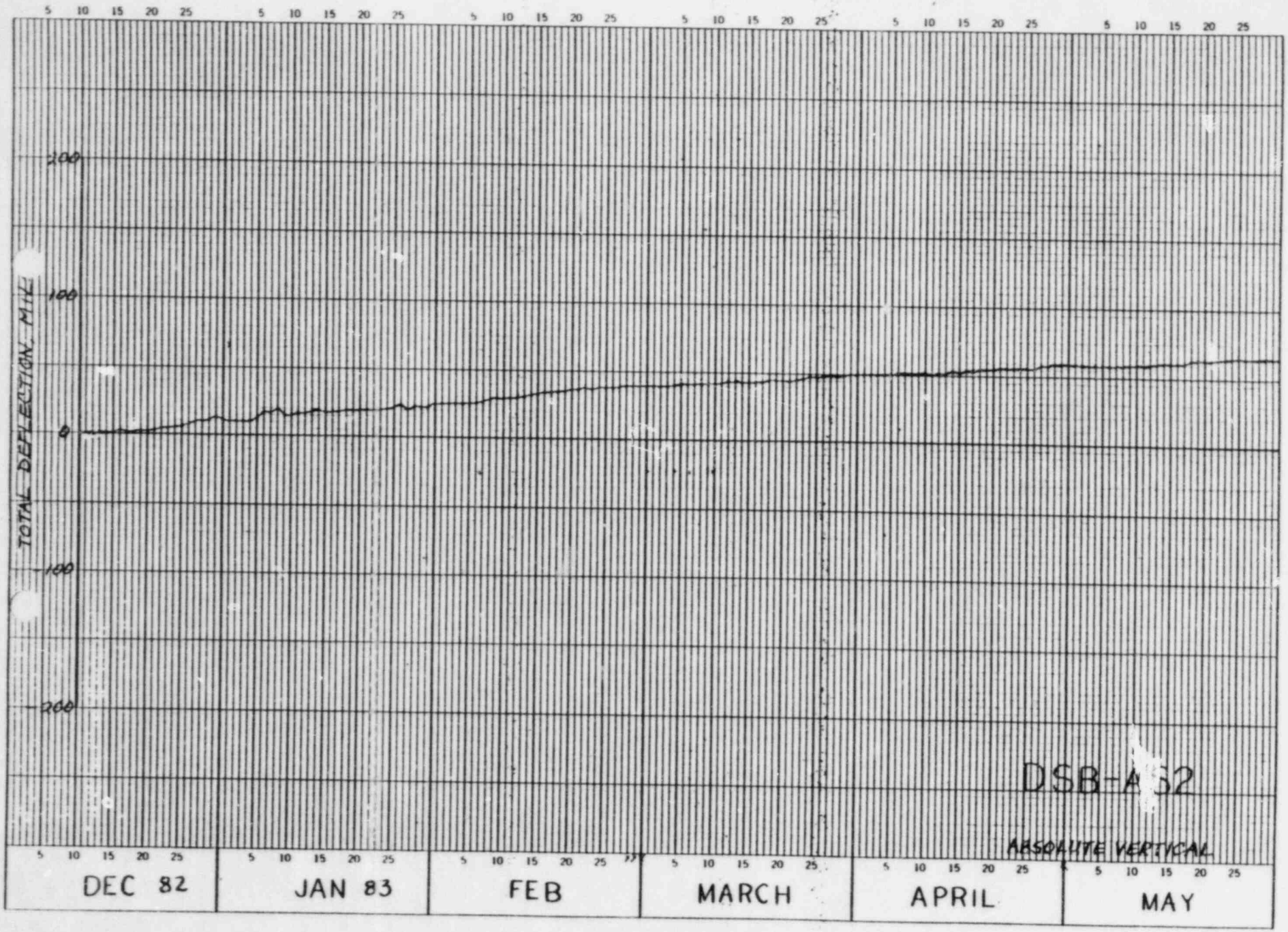
46 2610

23

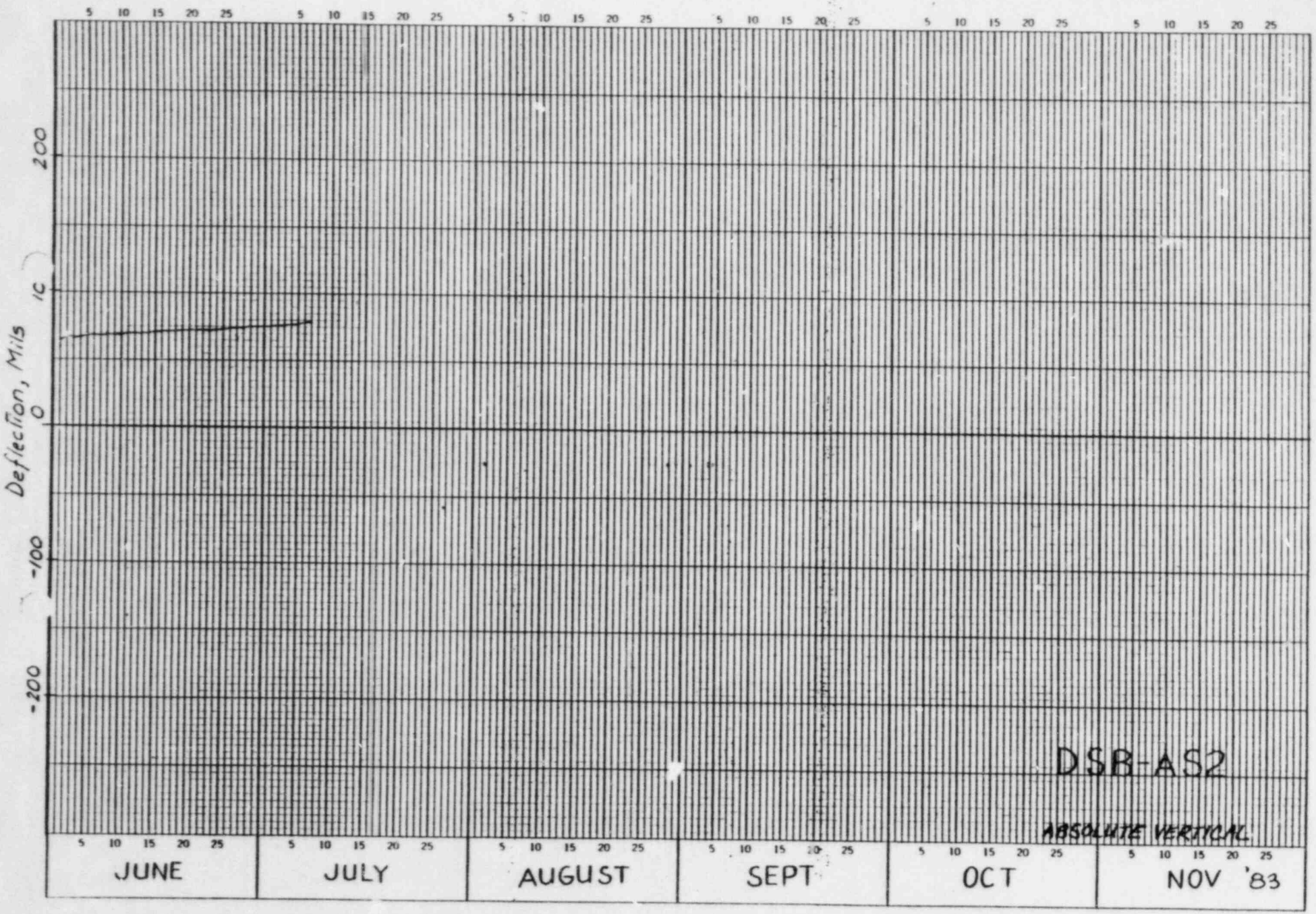


K·E 6 MONTHS BY DAYS X 120 DIVISIONS
KEUFFEL & ESSER CO

46 2610

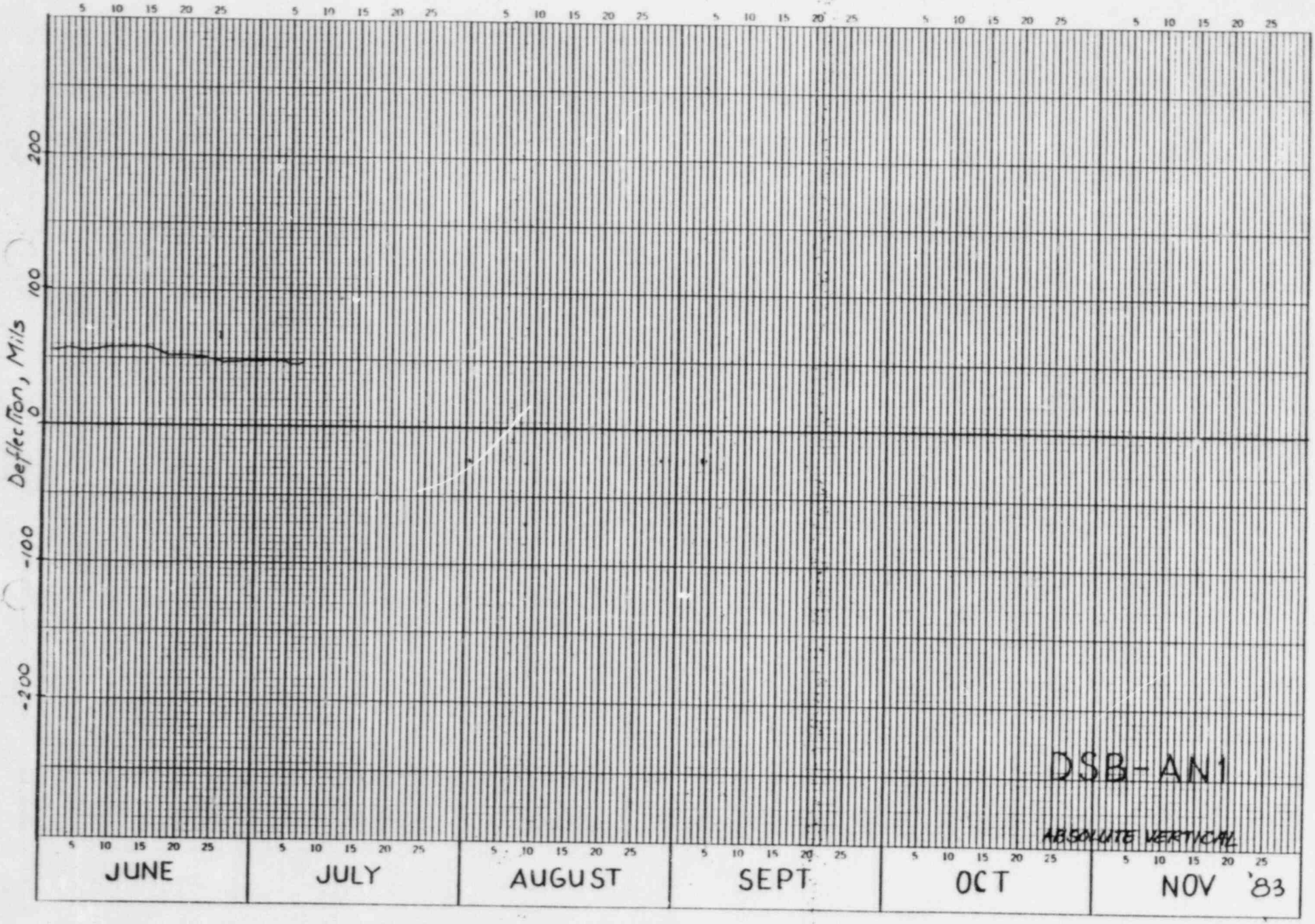


46 2610



46 2610

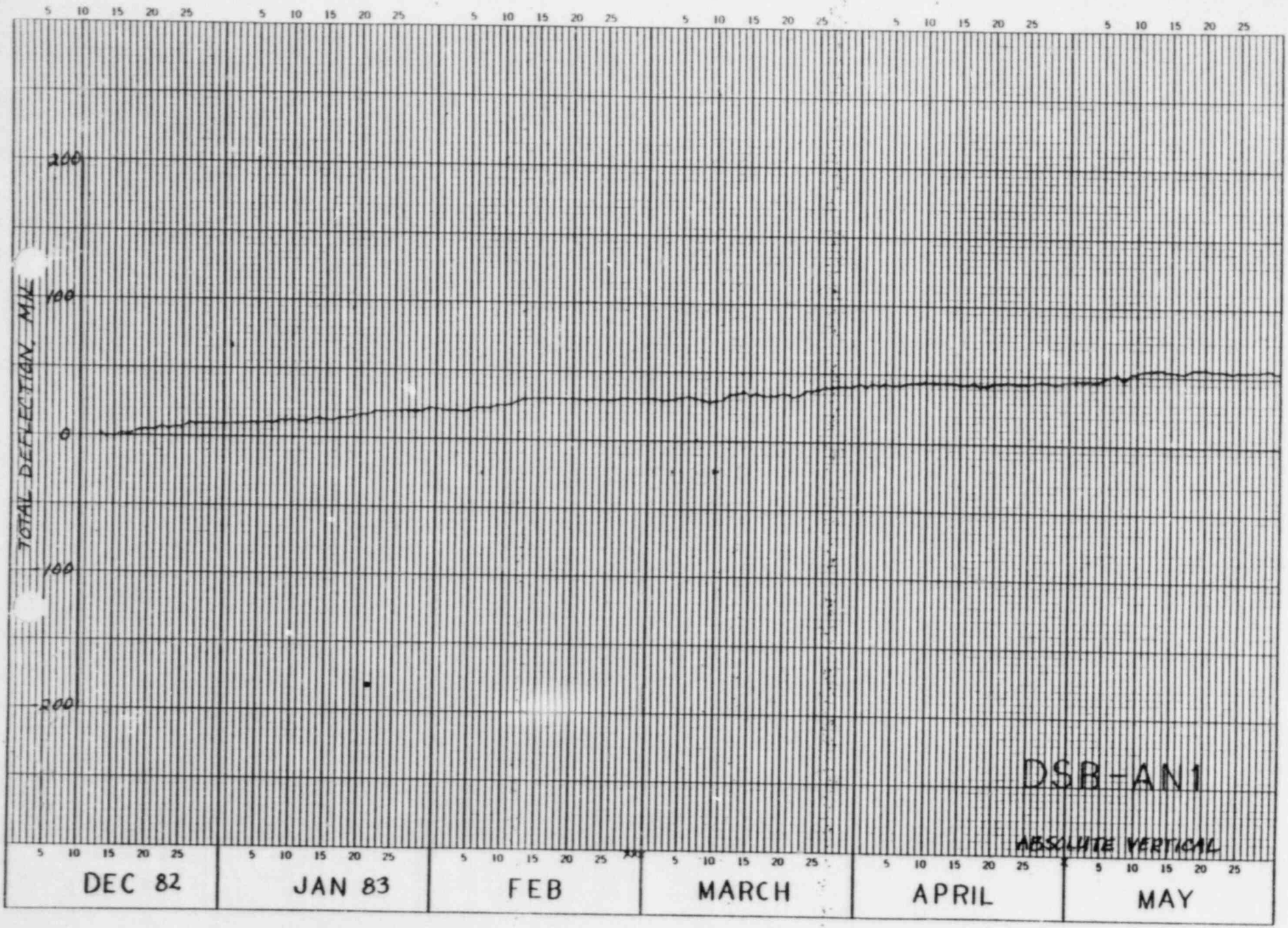
31



K·E 6 MONTHS BY DAYS X 120 DIVISIONS
KEUFFEL & ESSER CO MADE IN U.S.A.

46 2610

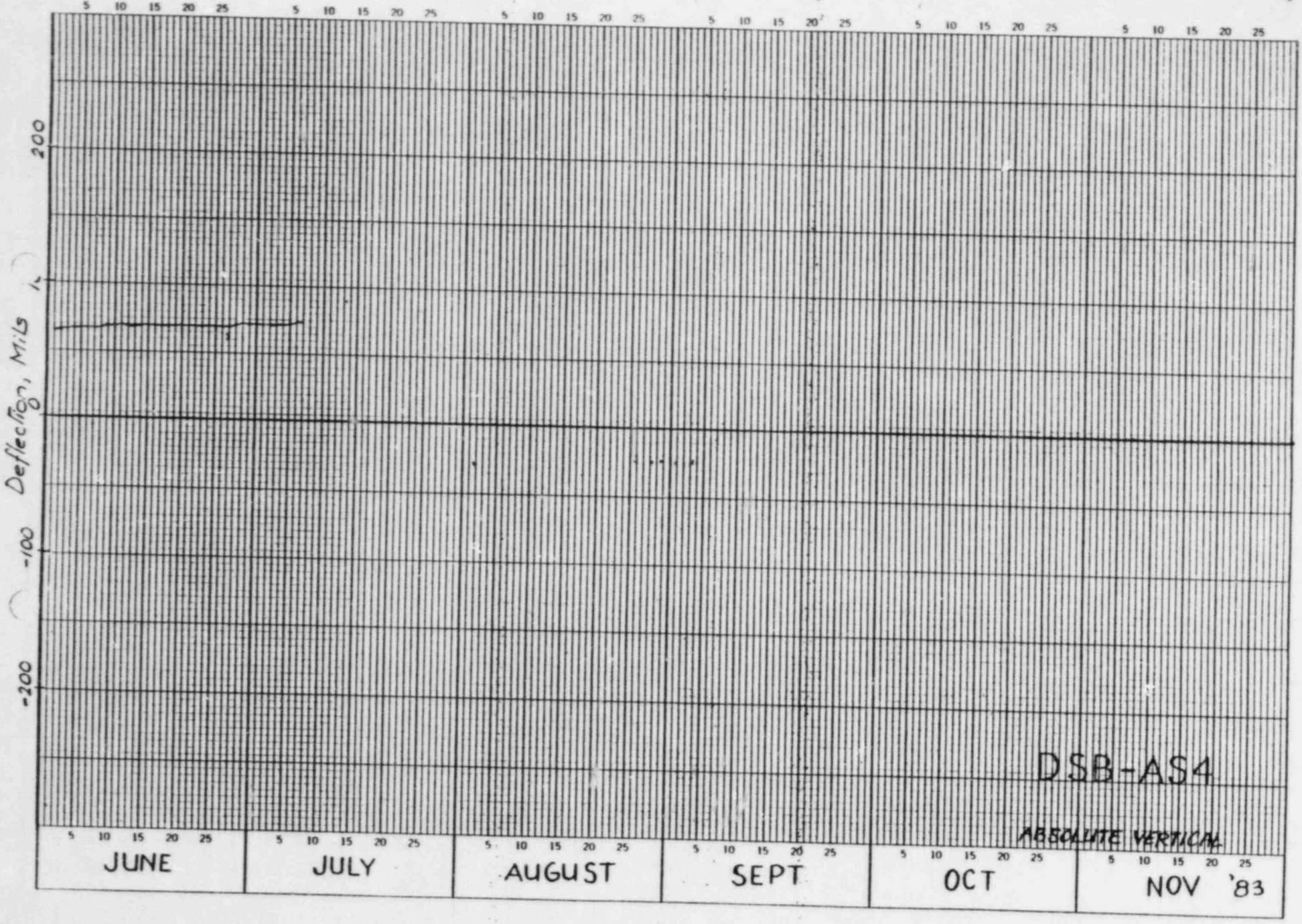
30



K·E 6 MONTHS BY DAYS X 120 DIVISIONS
KEUFFEL & ESSER CO MADE IN U.S.A.

46 2610

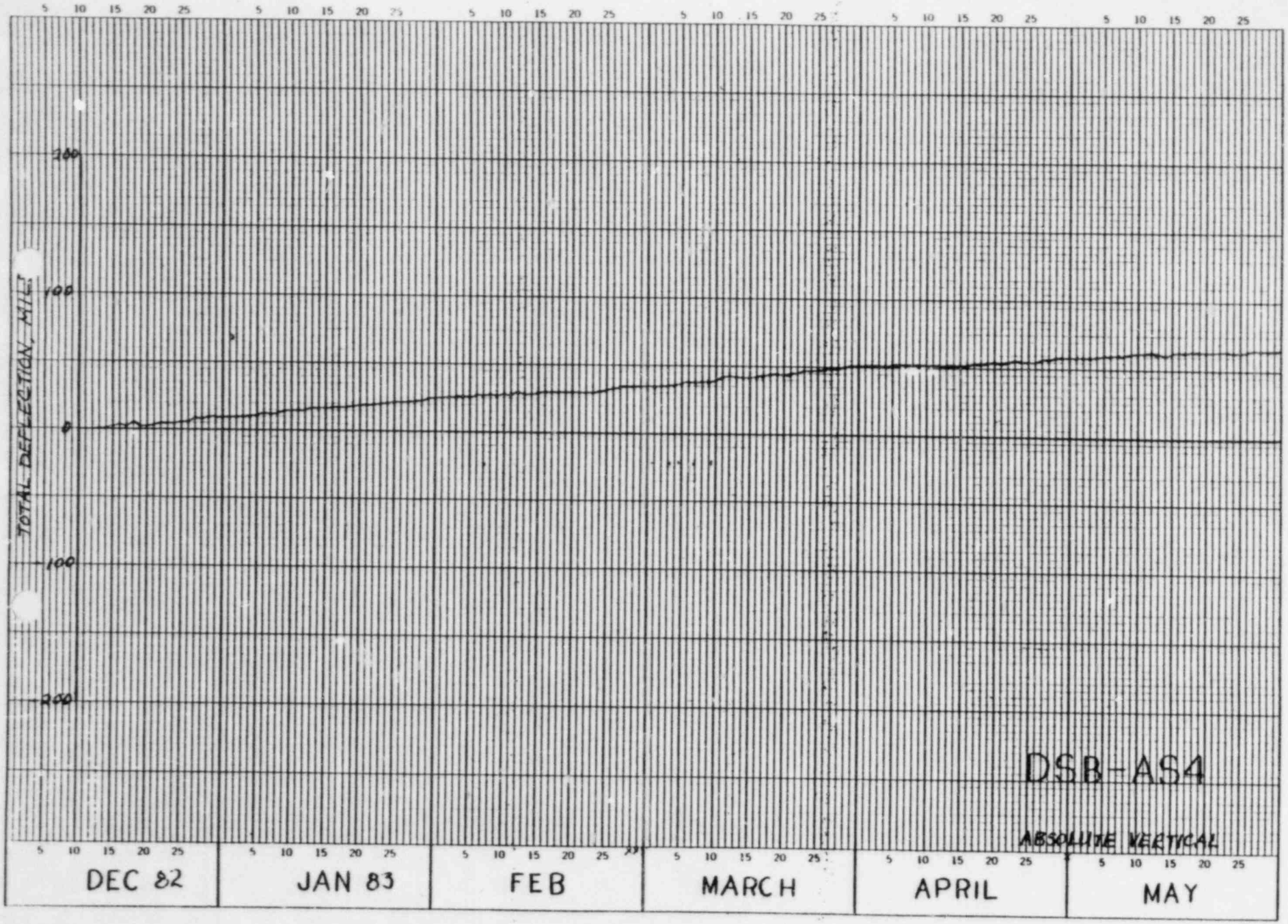
29



K·E 6 MONTHS BY DAYS X 120 DIVISIONS
KEUFFEL & ESSER CO.

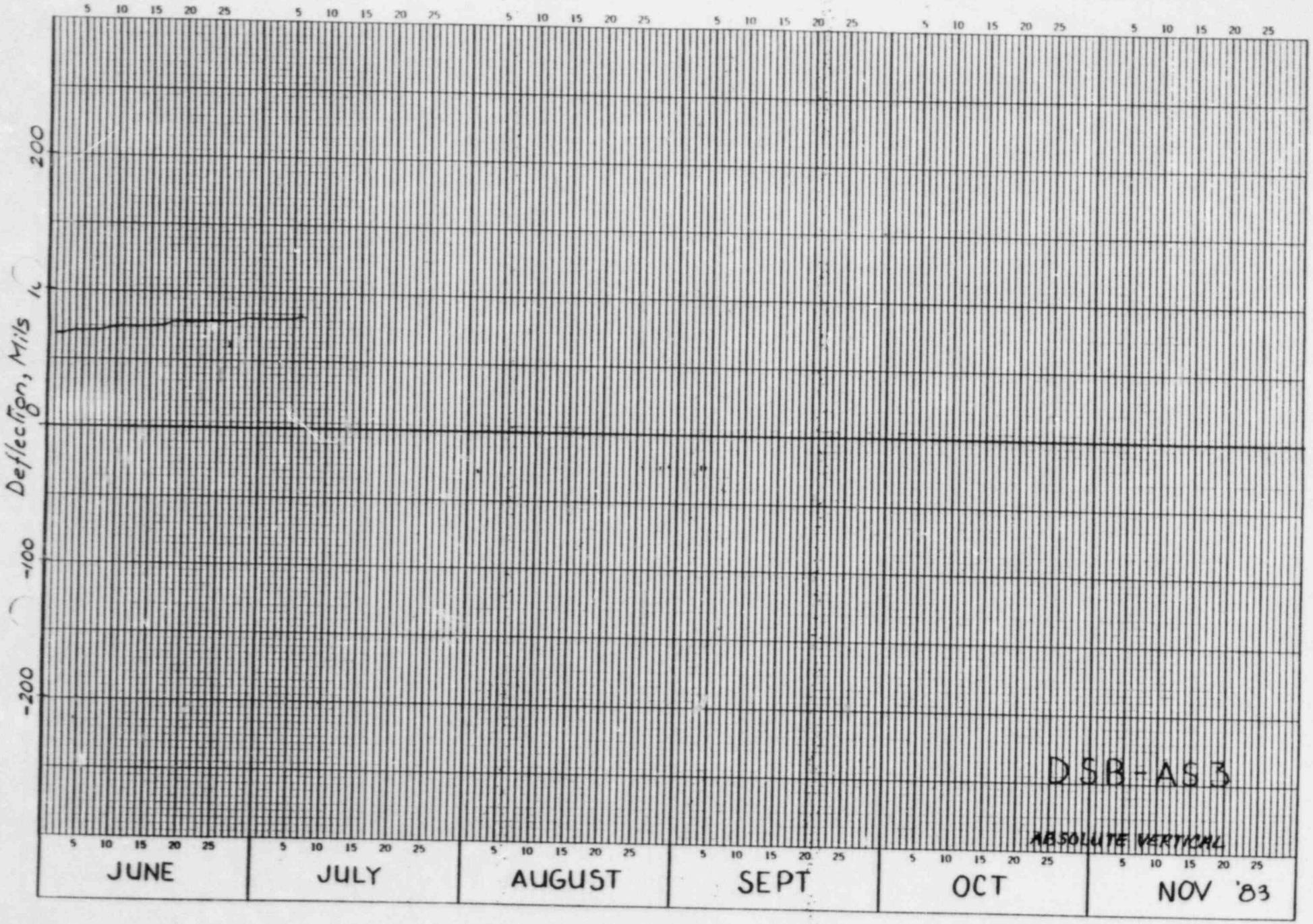
46 2610

28



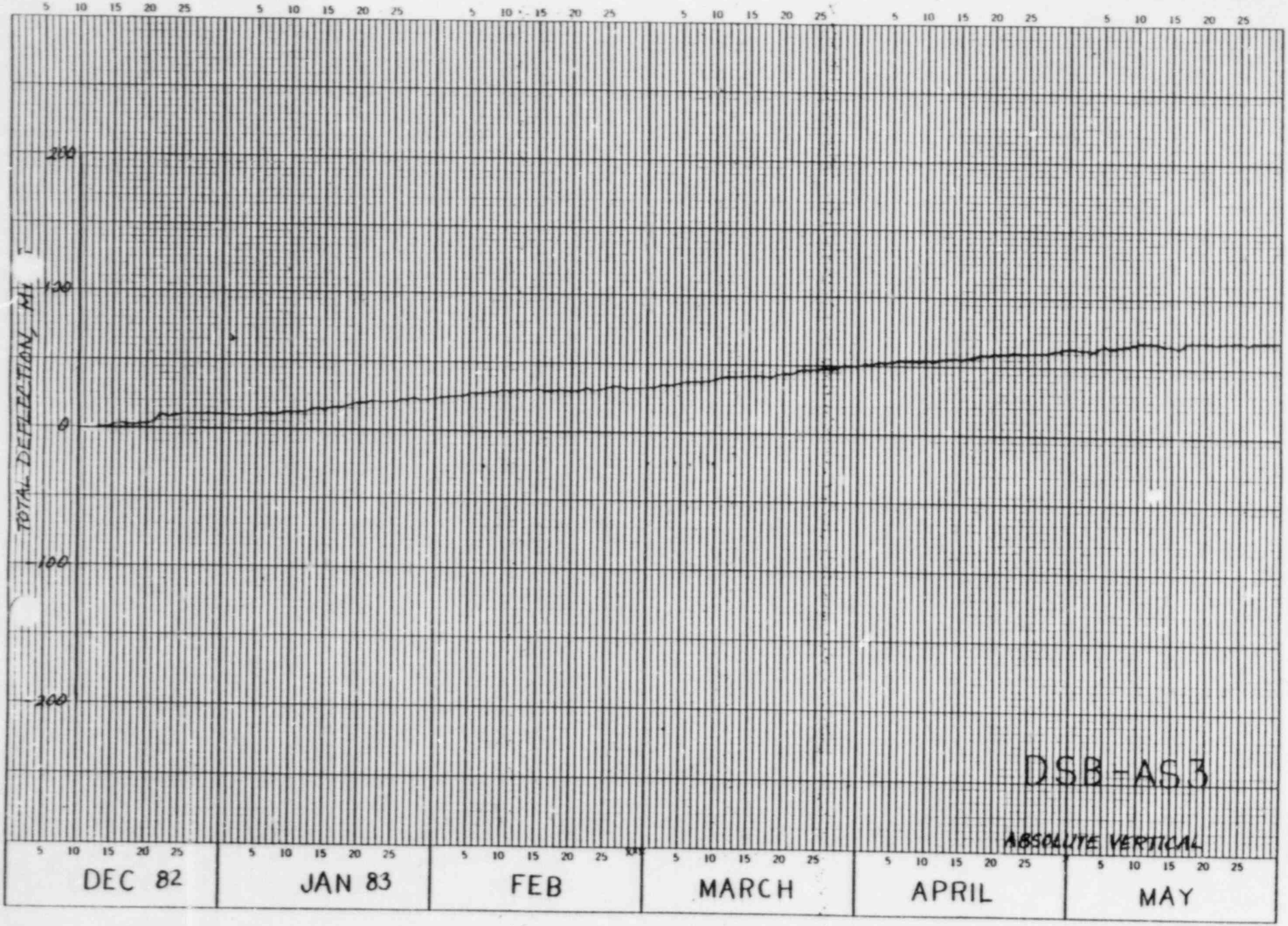
K·E 6 MONTHS BY DAYS X 120 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 2610



K·E 6 MONTHS BY DAYS X 120 DIVISIONS
KEUFFEL & ESSER CO MADE IN U.S.A.

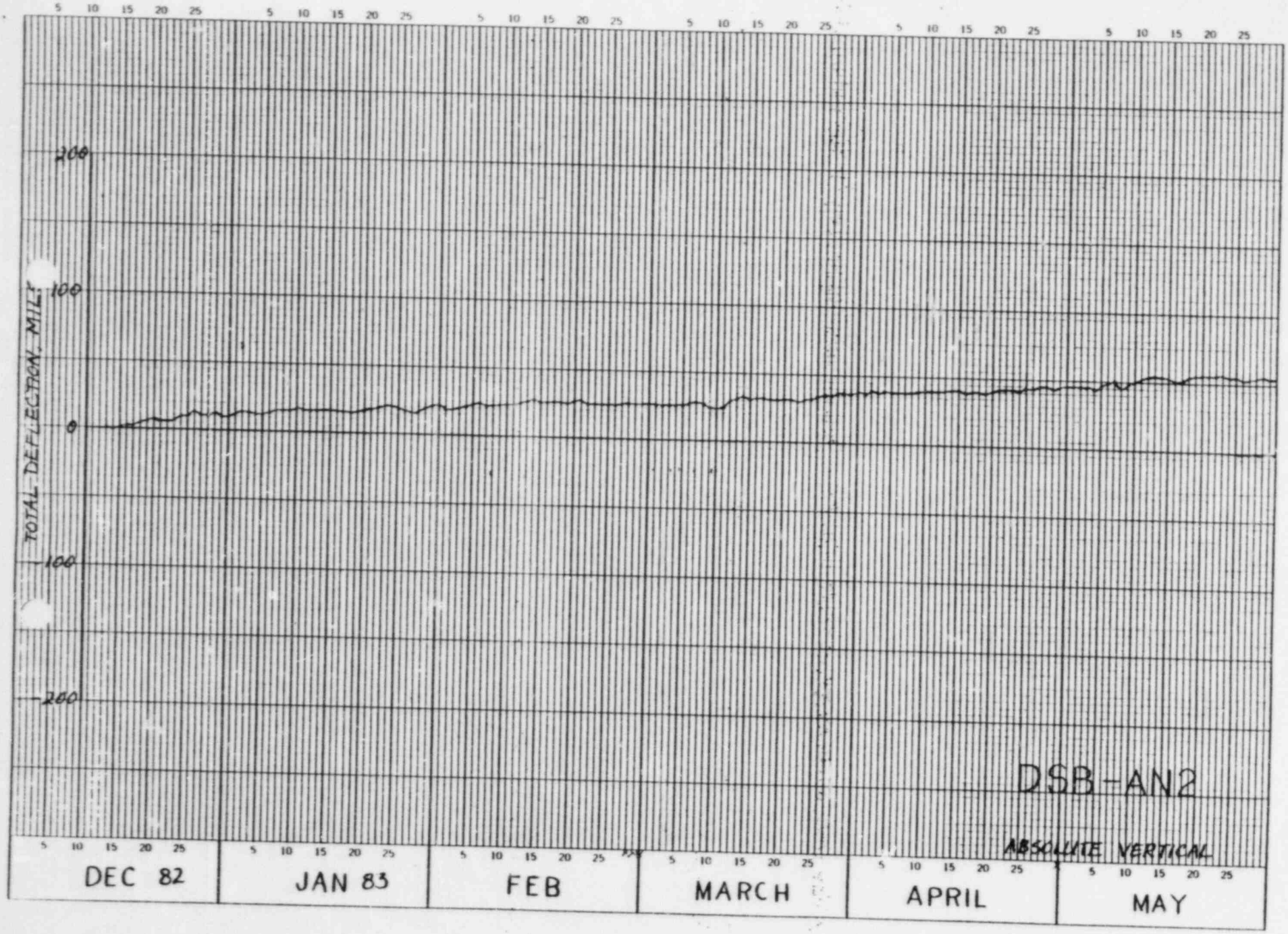
46 2610

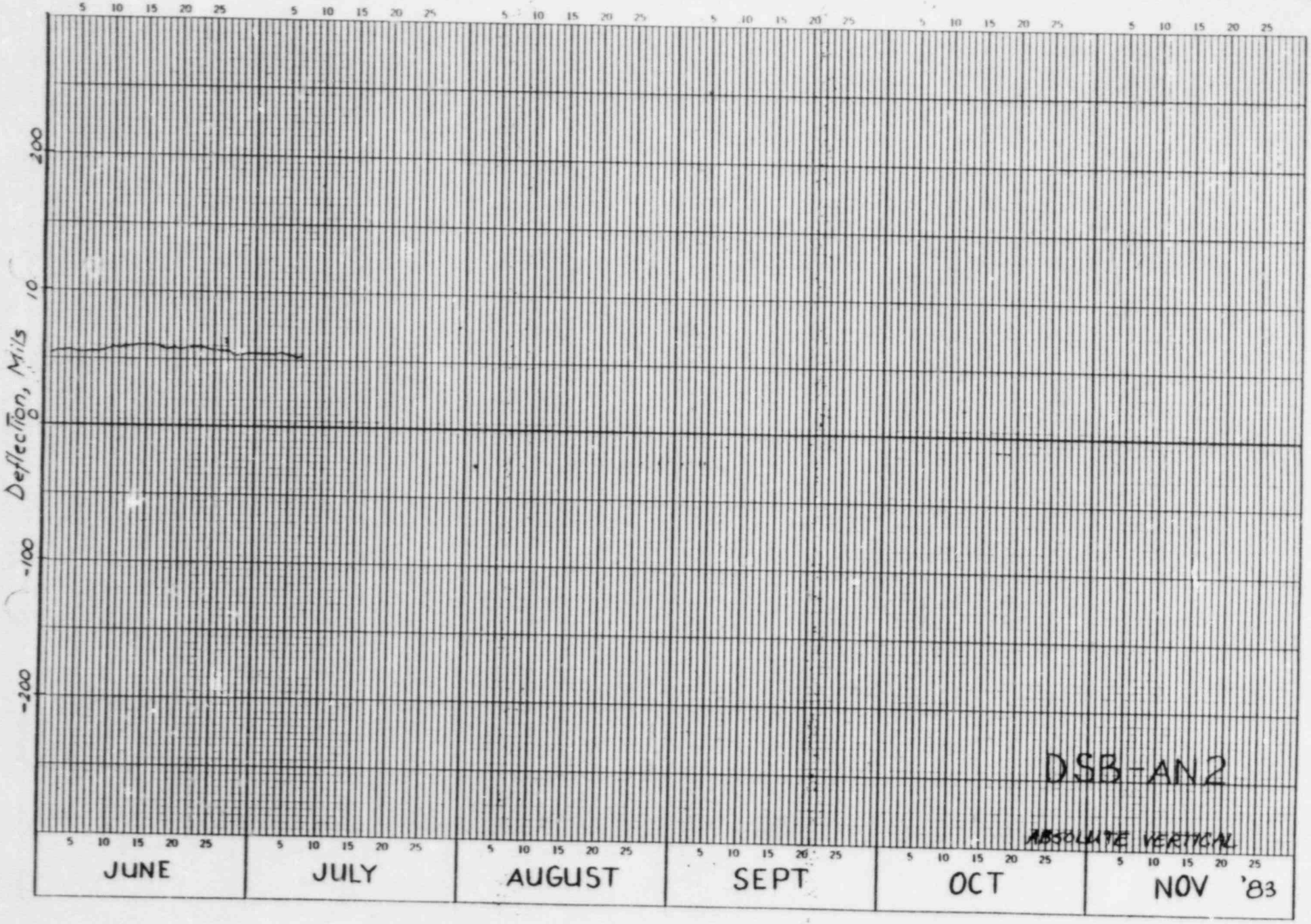


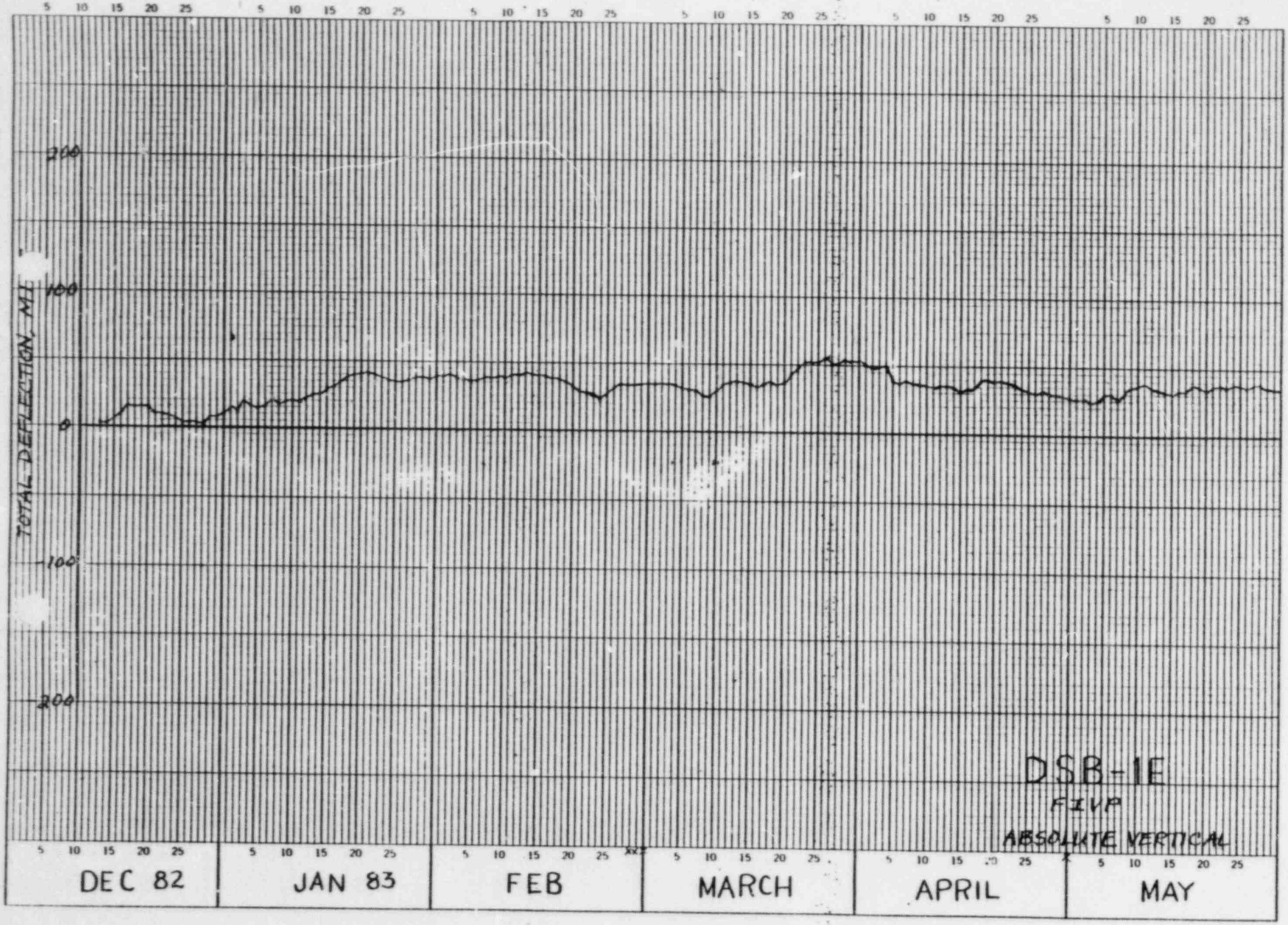
K·E 6 MONTHS BY DAYS X 120 DIVISIONS
KEUFFEL & ESSER CO

46 2610

32



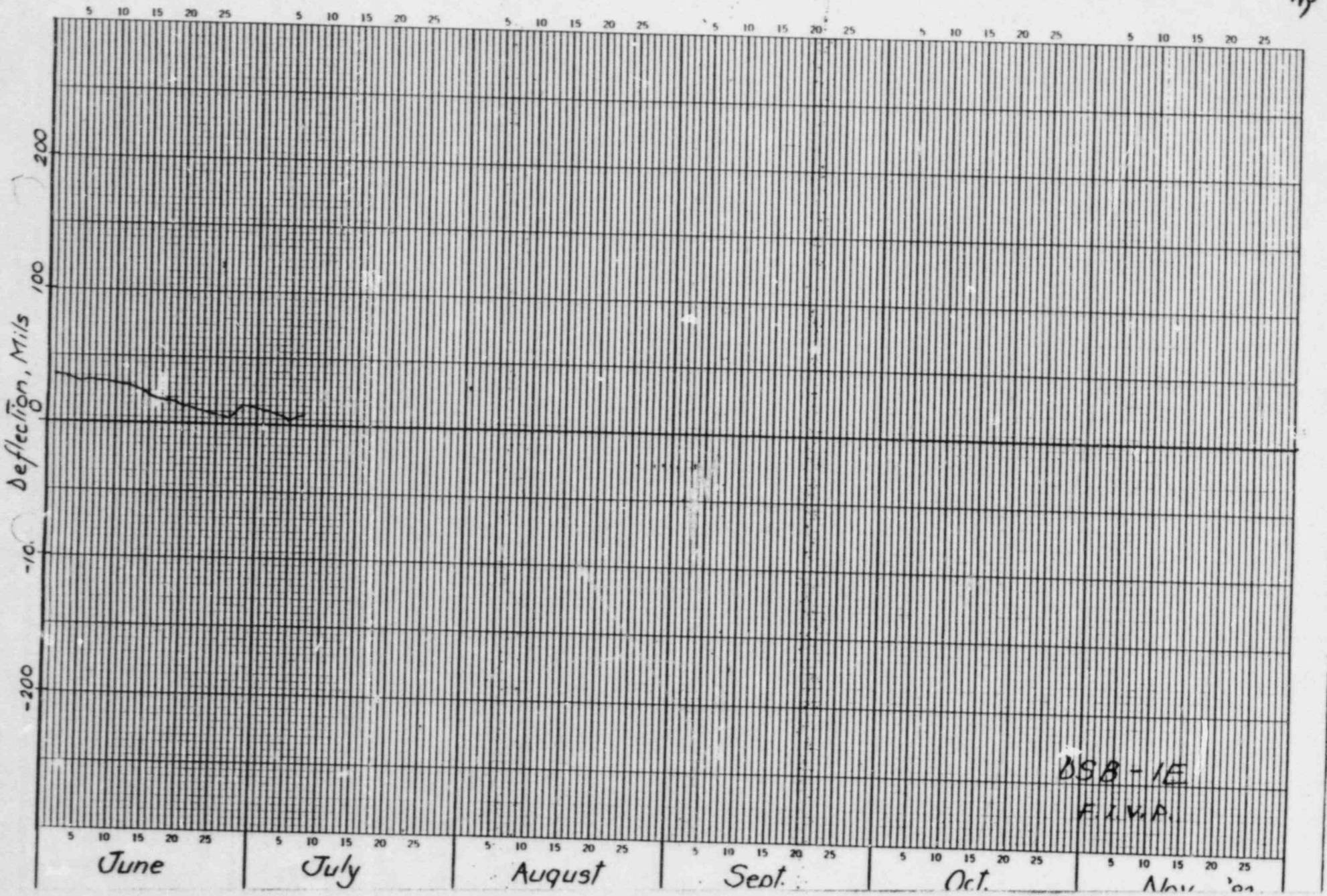

Deflection, Mils
200
10
0
-100
-200
5 10 15 20 25
JUNE
JULY
AUGUST
SEPT
OCT
NOV '83
DSB-AN2
ABSOLUTE VERTICAL


TOTAL DEFLECTION, MI
200
100
0
-100
-200
DEC 82
JAN 83
FEB
MARCH
APRIL
MAY
DSB-1E
FIVP
ABSOLUTE VERTICAL

K·E 6 MONTHS BY DAYS X 120 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

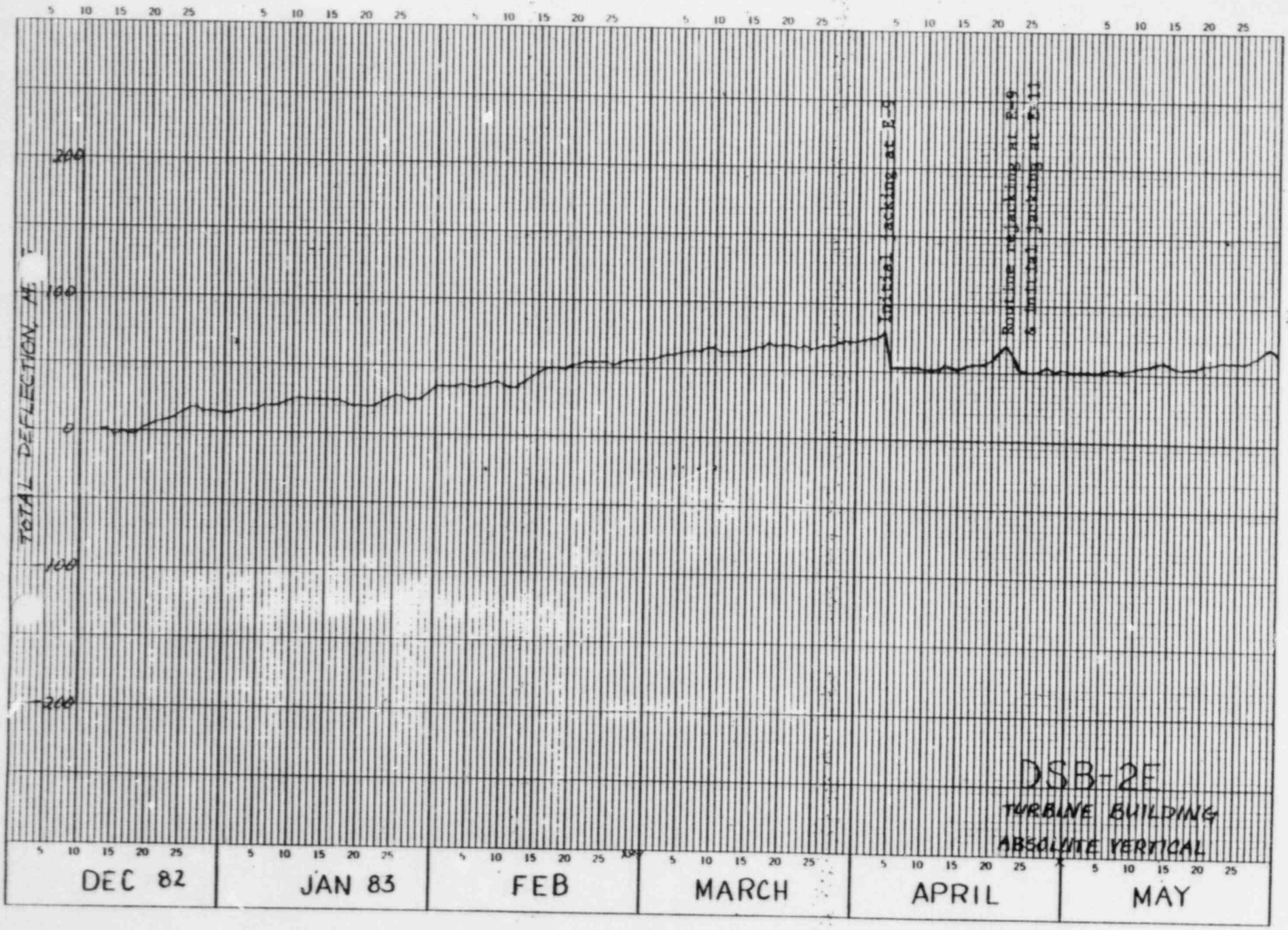
46 2610

35

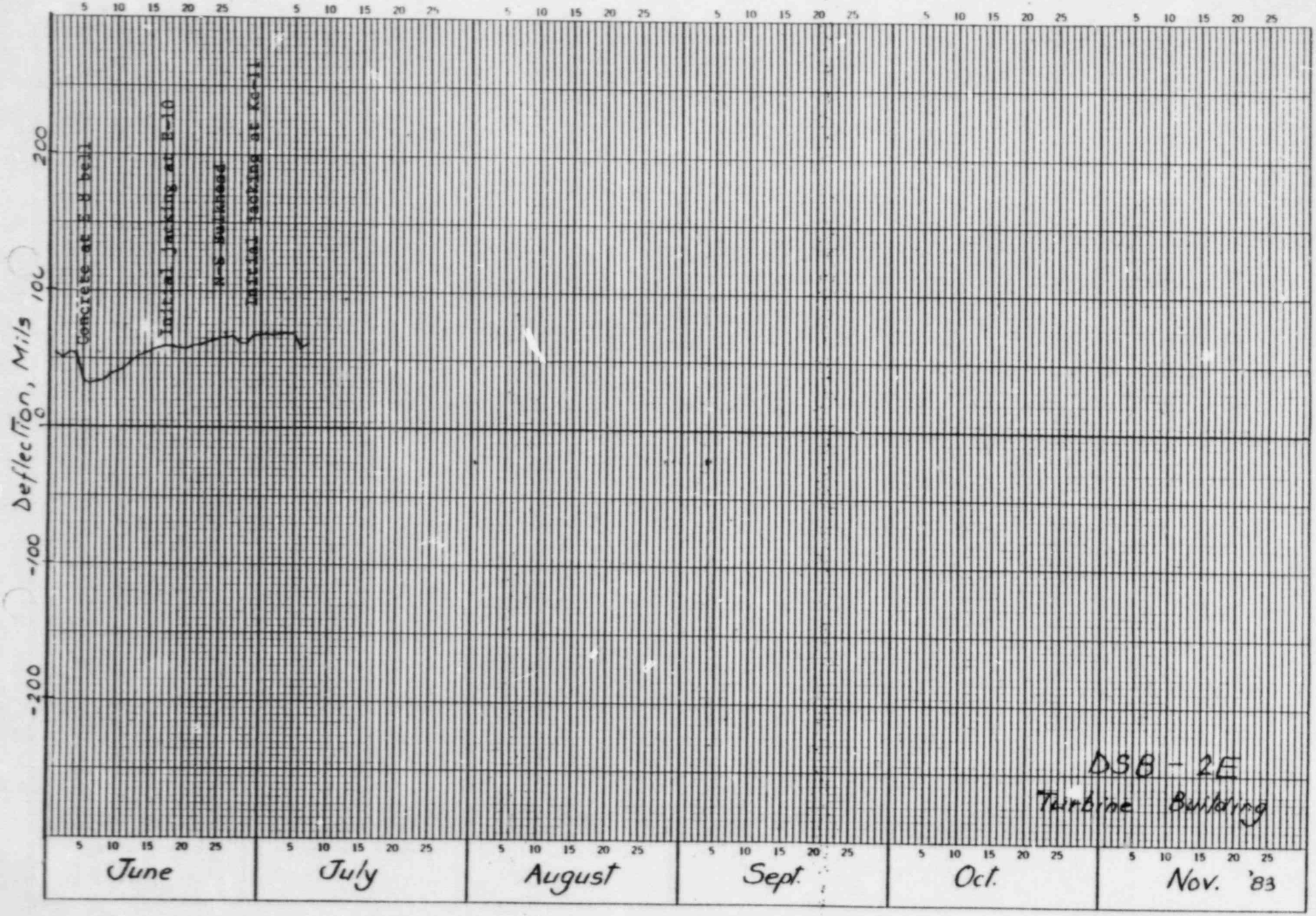


46 2610

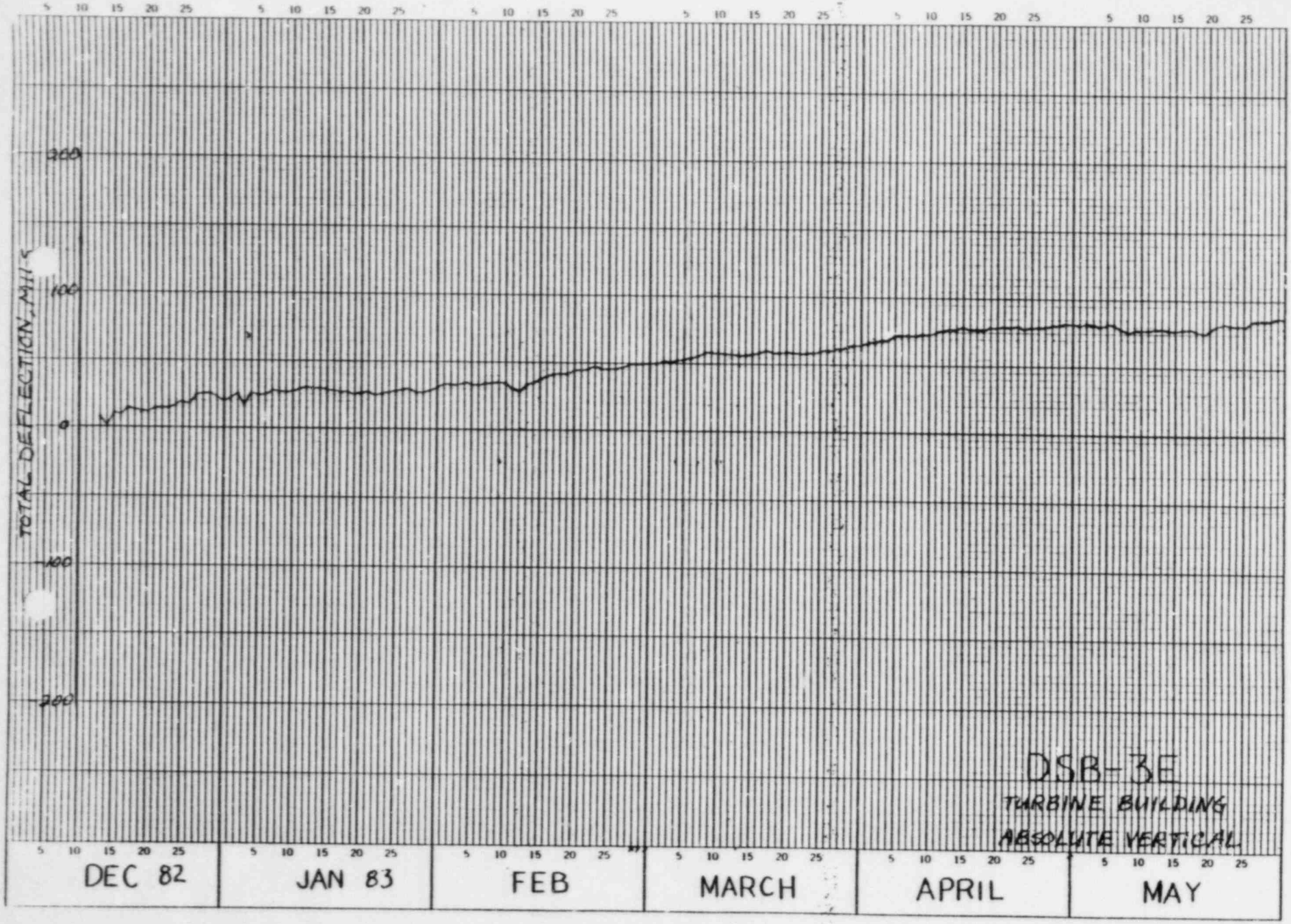
36

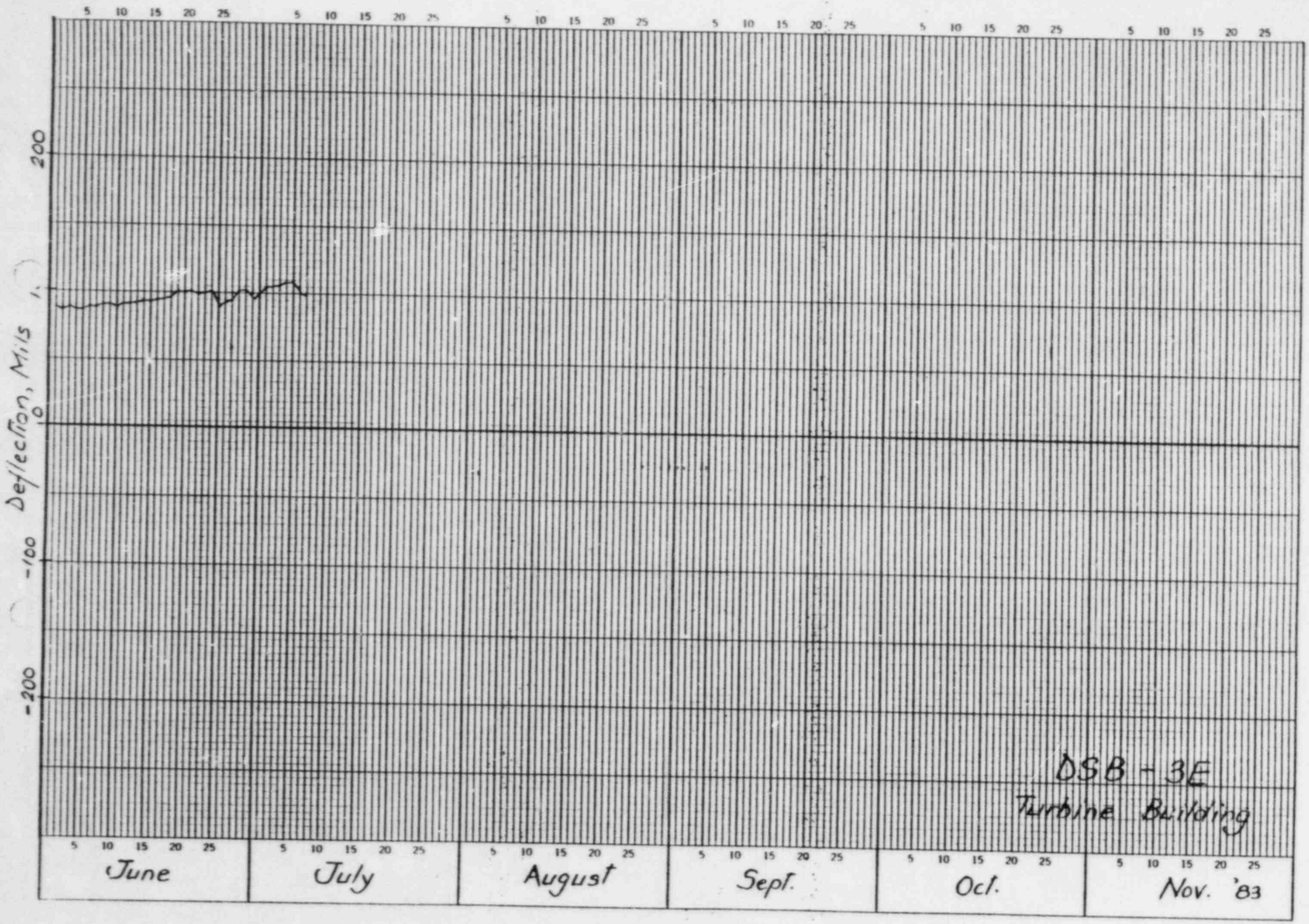


DSB-2E
TURBINE BUILDING
ABSOLUTE VERTICAL


Deflection, Mils
200
100
0
-100
-200
Concrete at E-9 bell
Initial jacking at E-10
N-S bulkhead
Initial jacking at E-11
June
July
August
Sept.
Oct.
Nov. '83
DSB - 2E
Turbine Building

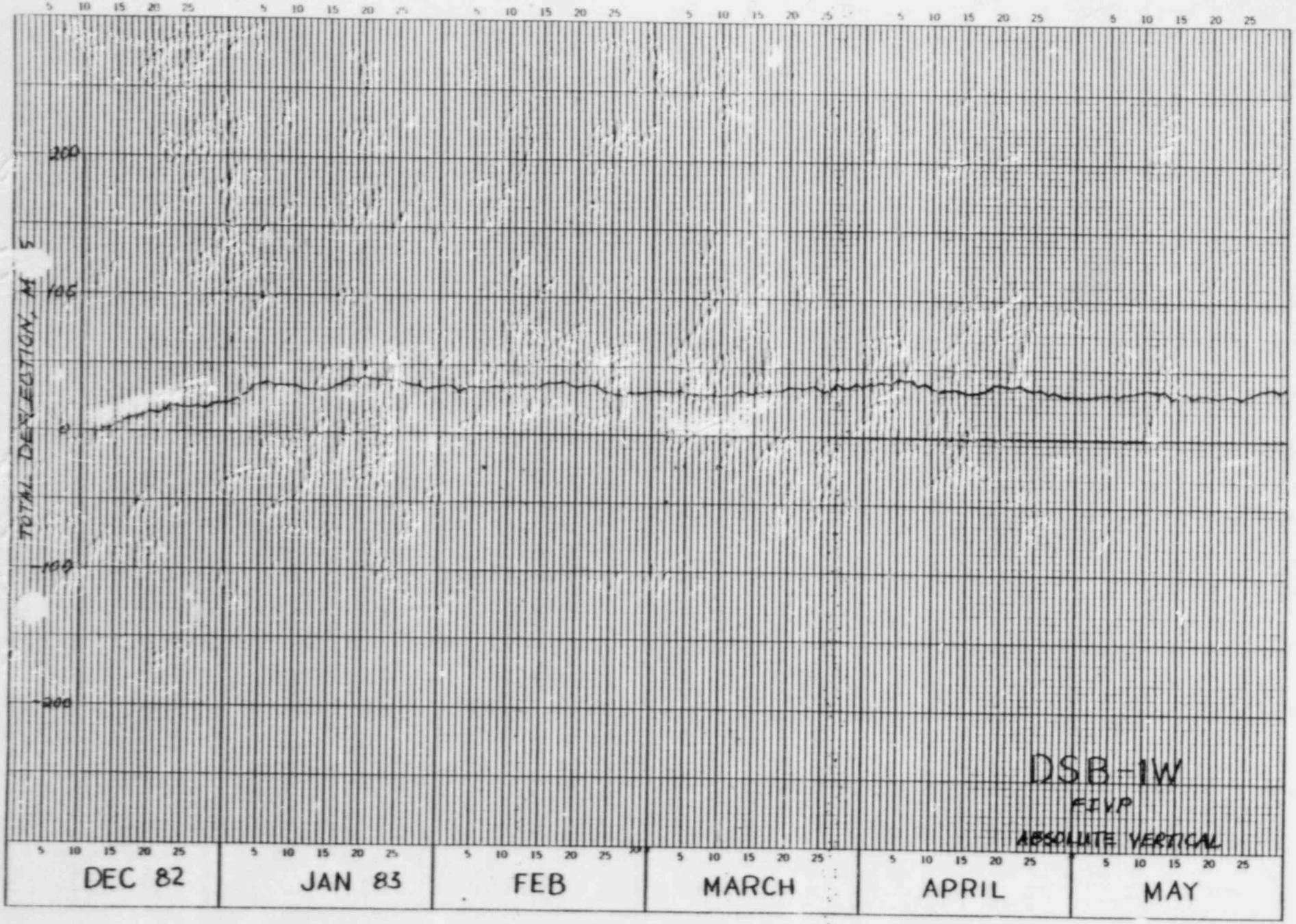
K·E 6 MONTHS BY DAYS X 120 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 2610





46 2610

40



K·E 6 MONTHS BY DAYS X 120 DIVISIONS
KEUFFEL & ESSER CO

46 2610

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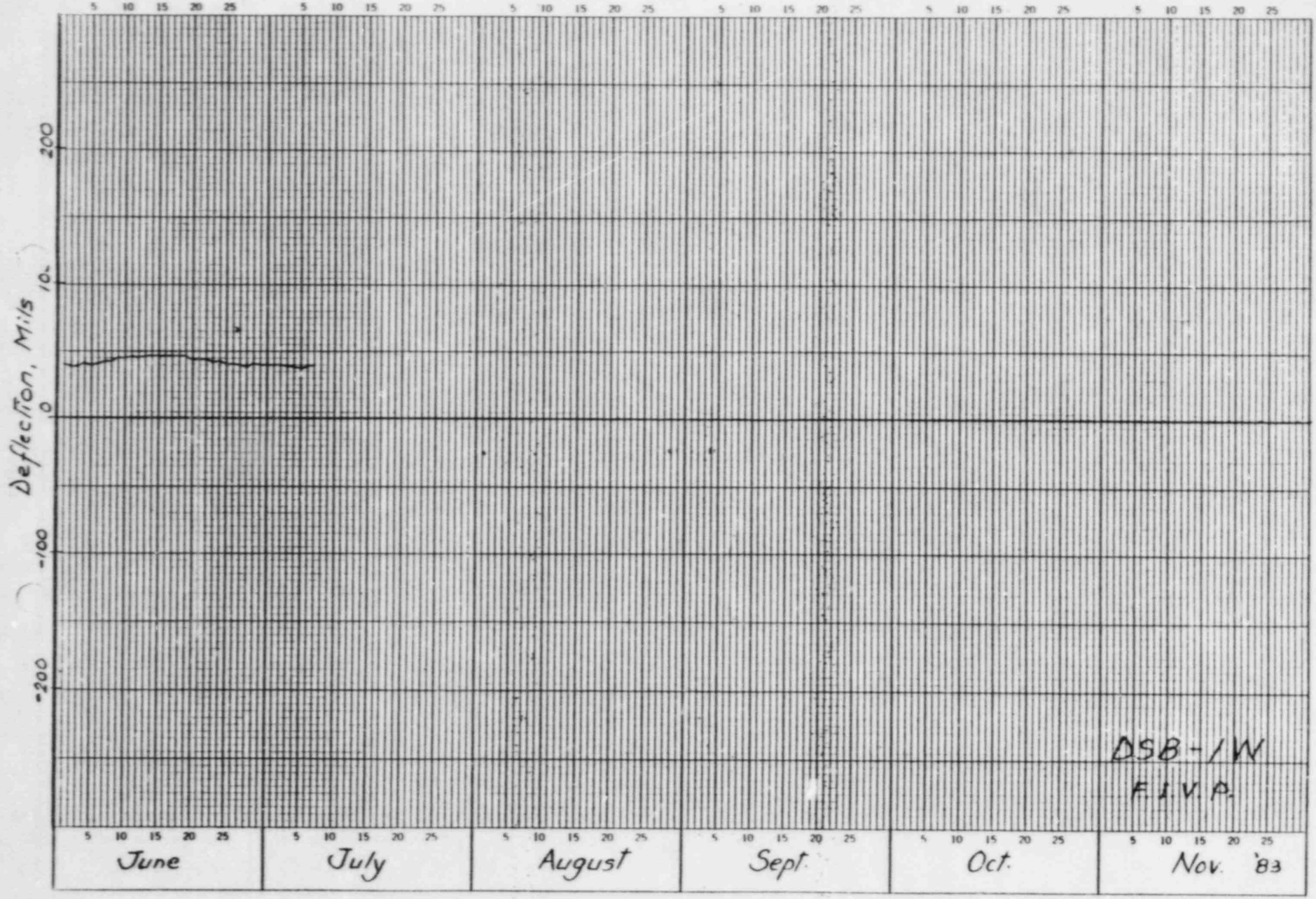
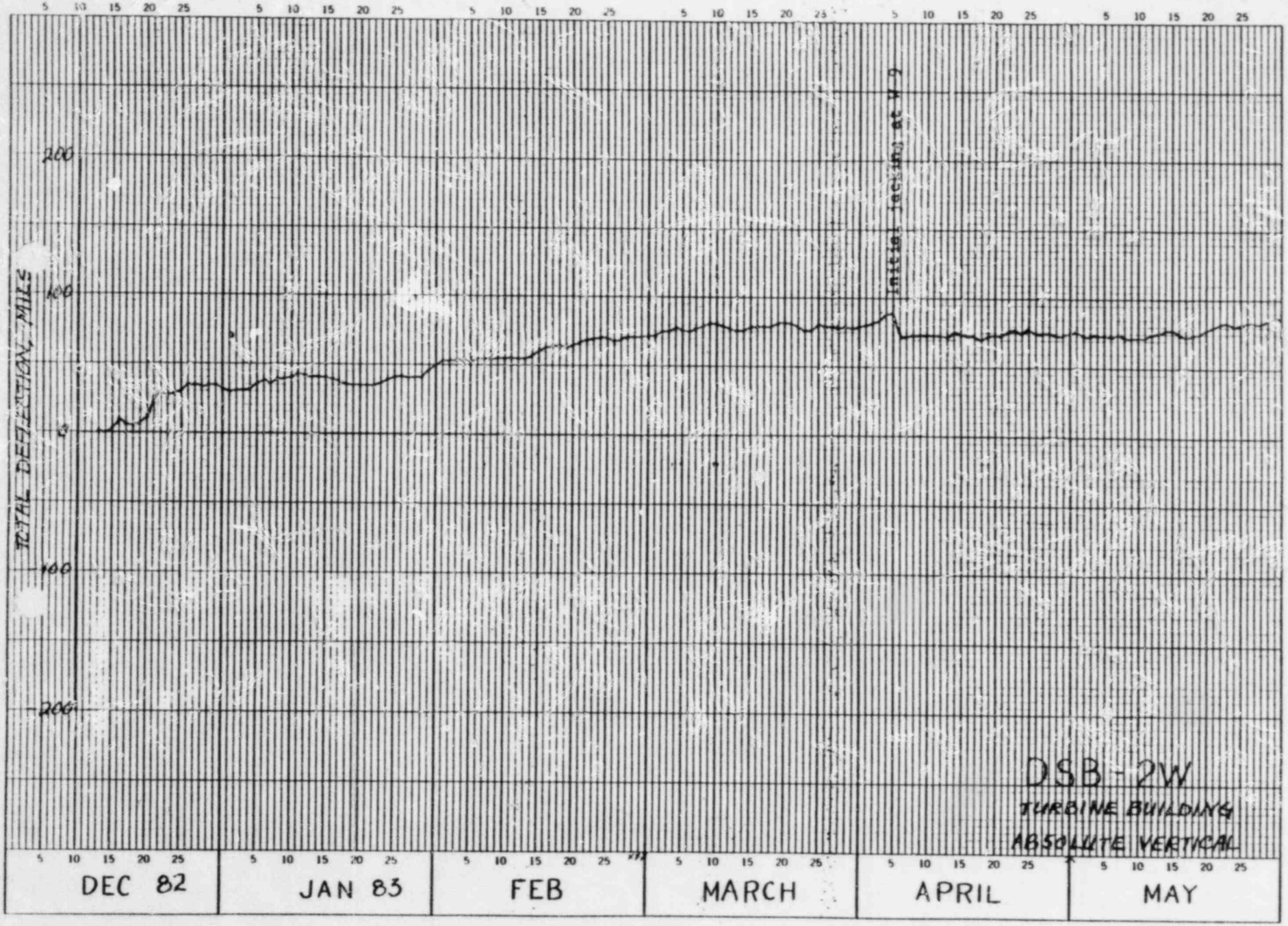
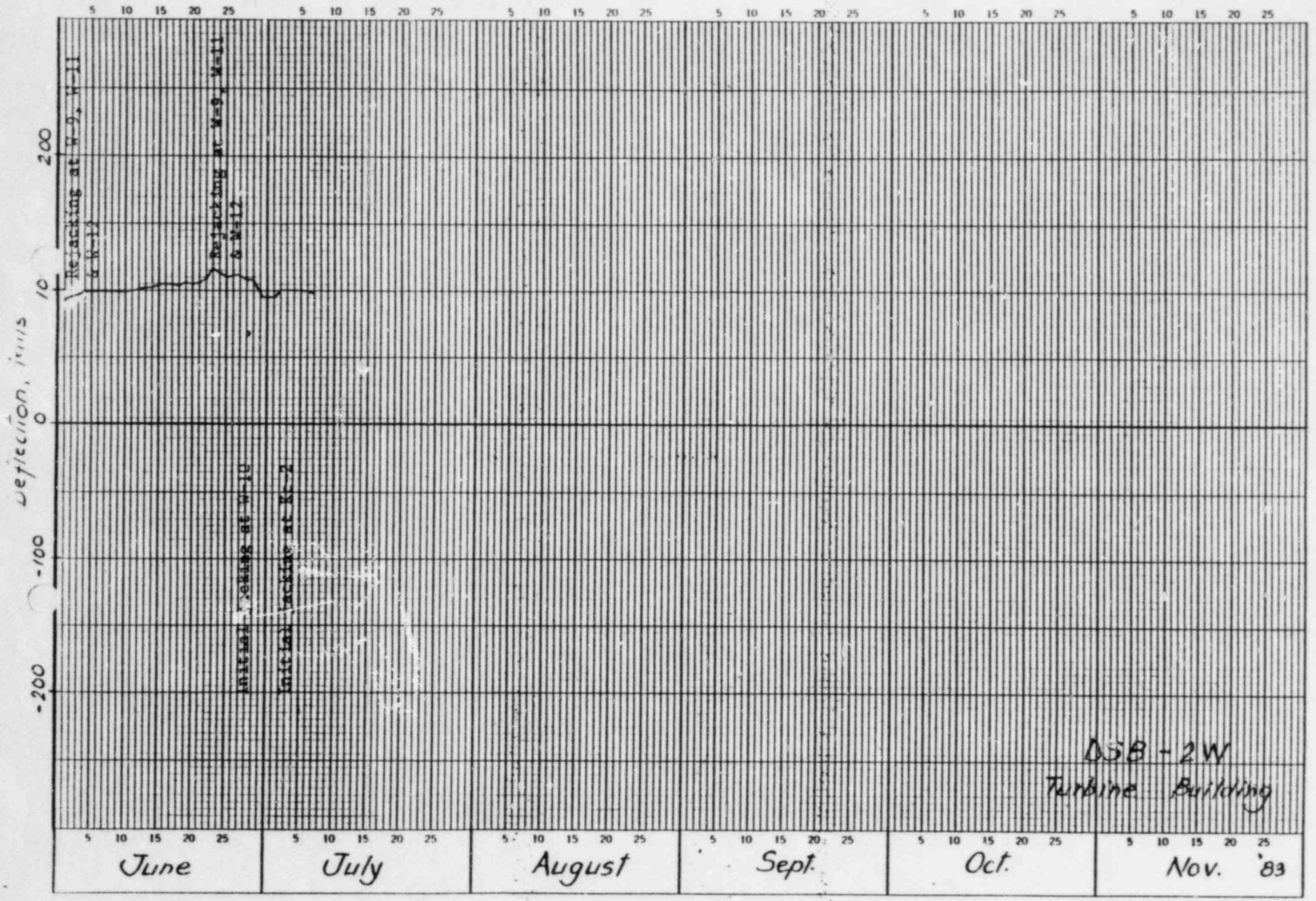


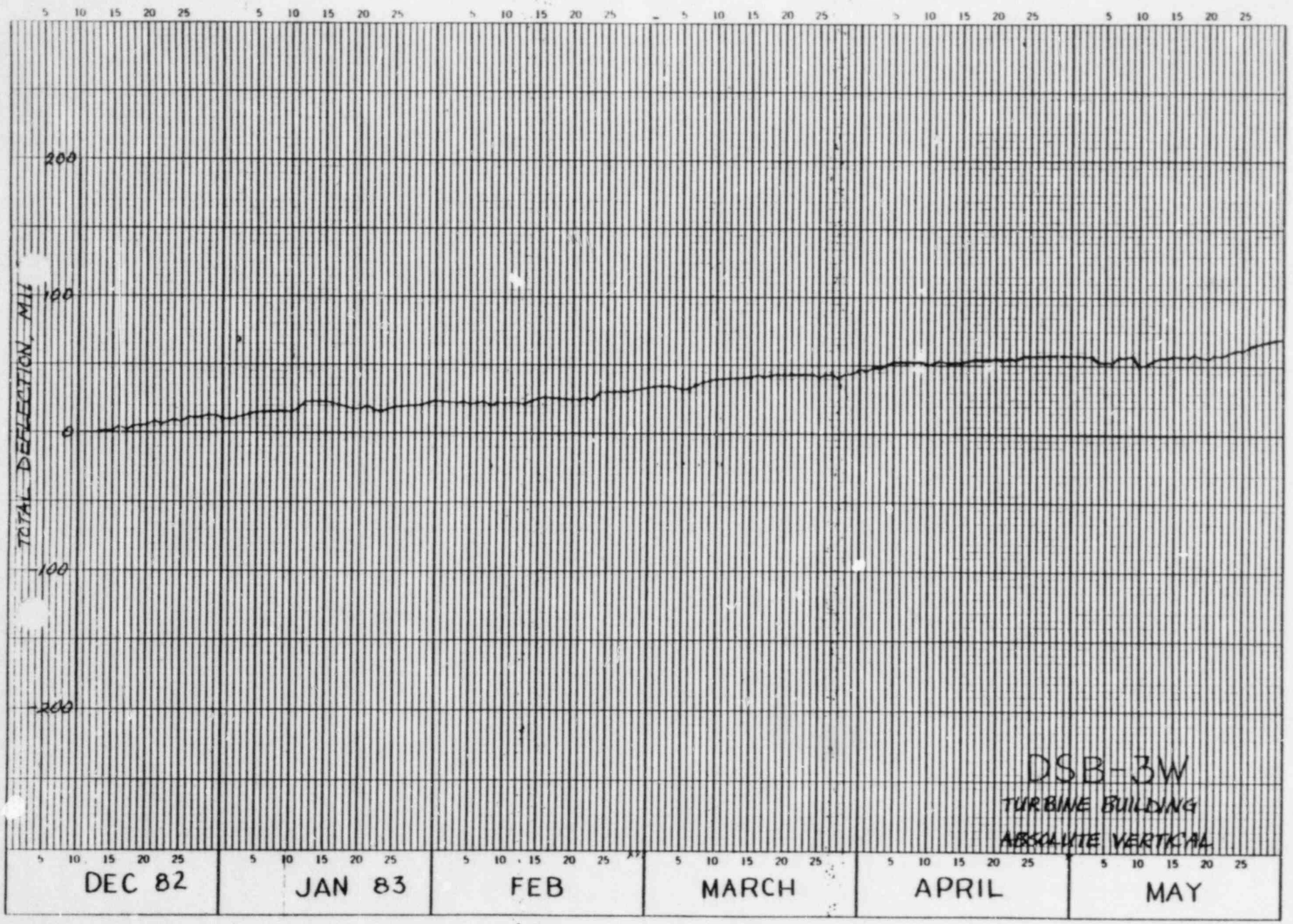

TOTAL DEFLECTION, MILS
200
100
0
100
200
Initial Jacking at 0.9
DSB - 2W
TURBINE BUILDING
ABSOLUTE VERTICAL
DEC 82
JAN 83
FEB
MARCH
APRIL
MAY


Deflection, mils
200
10
0
-100
-200
Relacking at W-9, W-11 & W-12
Relacking at W-9, W-11 & W-12
Initial leakage at W-10
Initial leakage at W-2
DSB - 2W
Turbine Building
5 10 15 20 25
June
July
August
Sept.
Oct.
Nov. '83

K·E 6 MONTHS BY DAYS X 120 DIVISIONS
KEUFFEL & ESSER CO

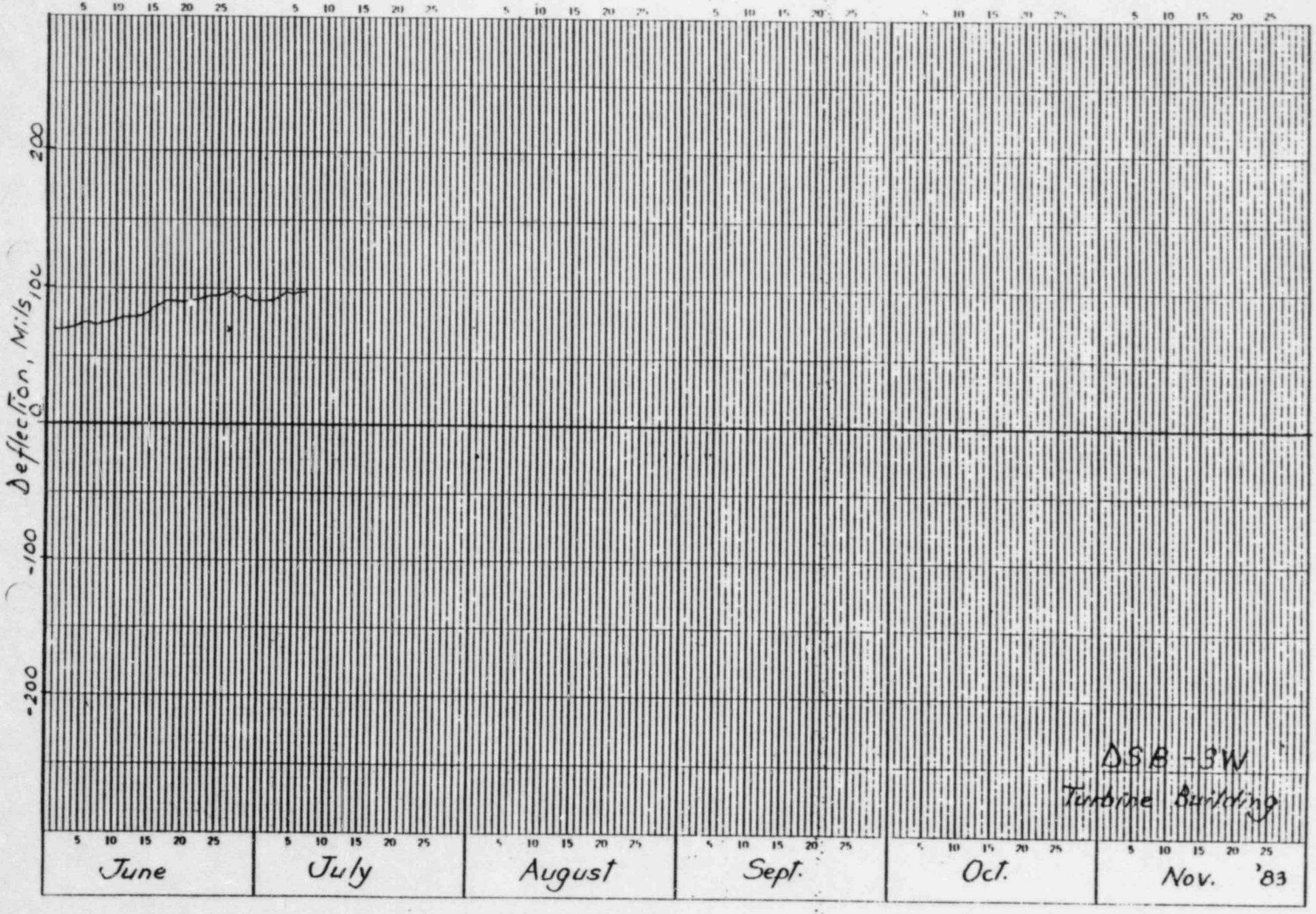
46 2610

44



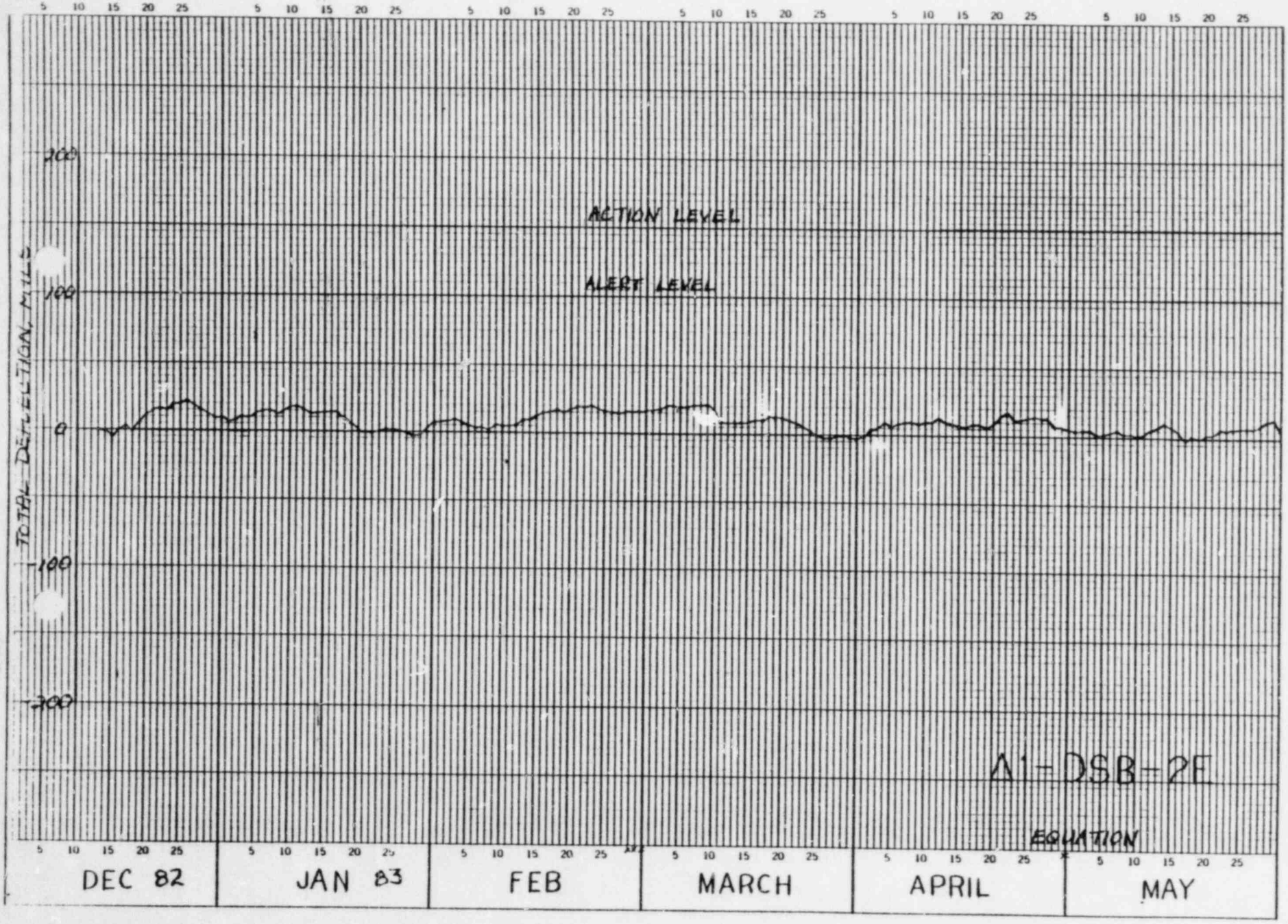
46 2610

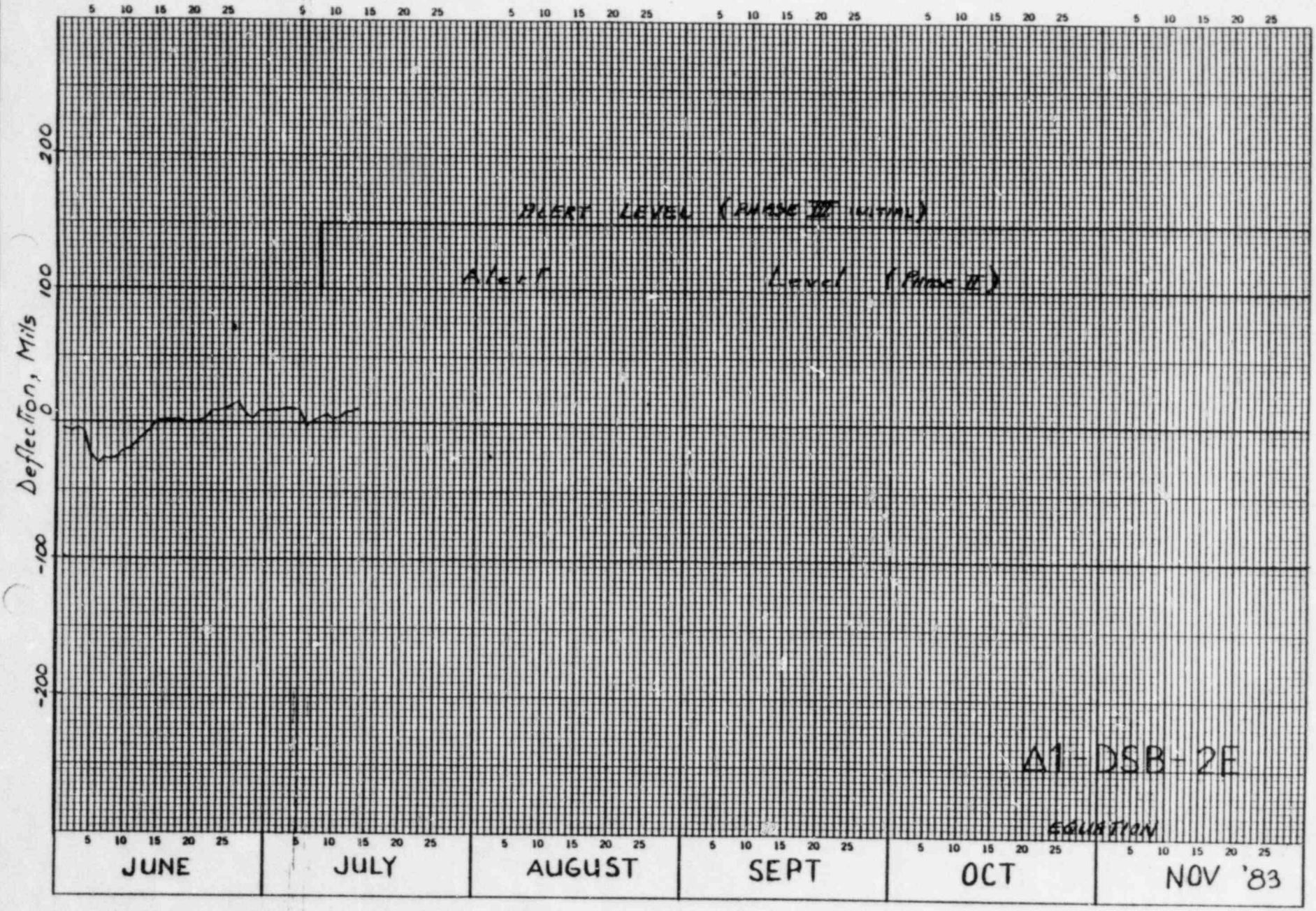
A5

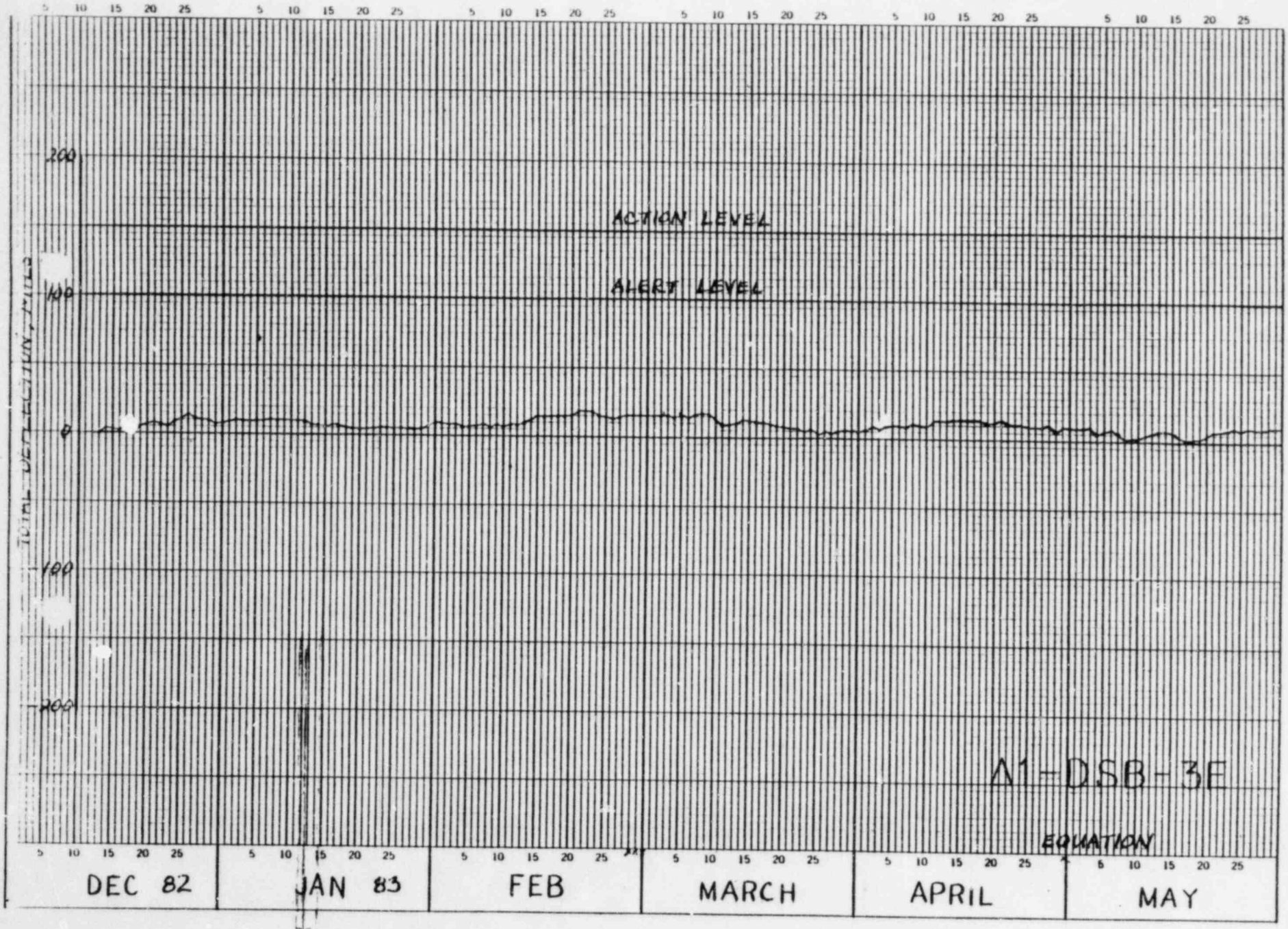


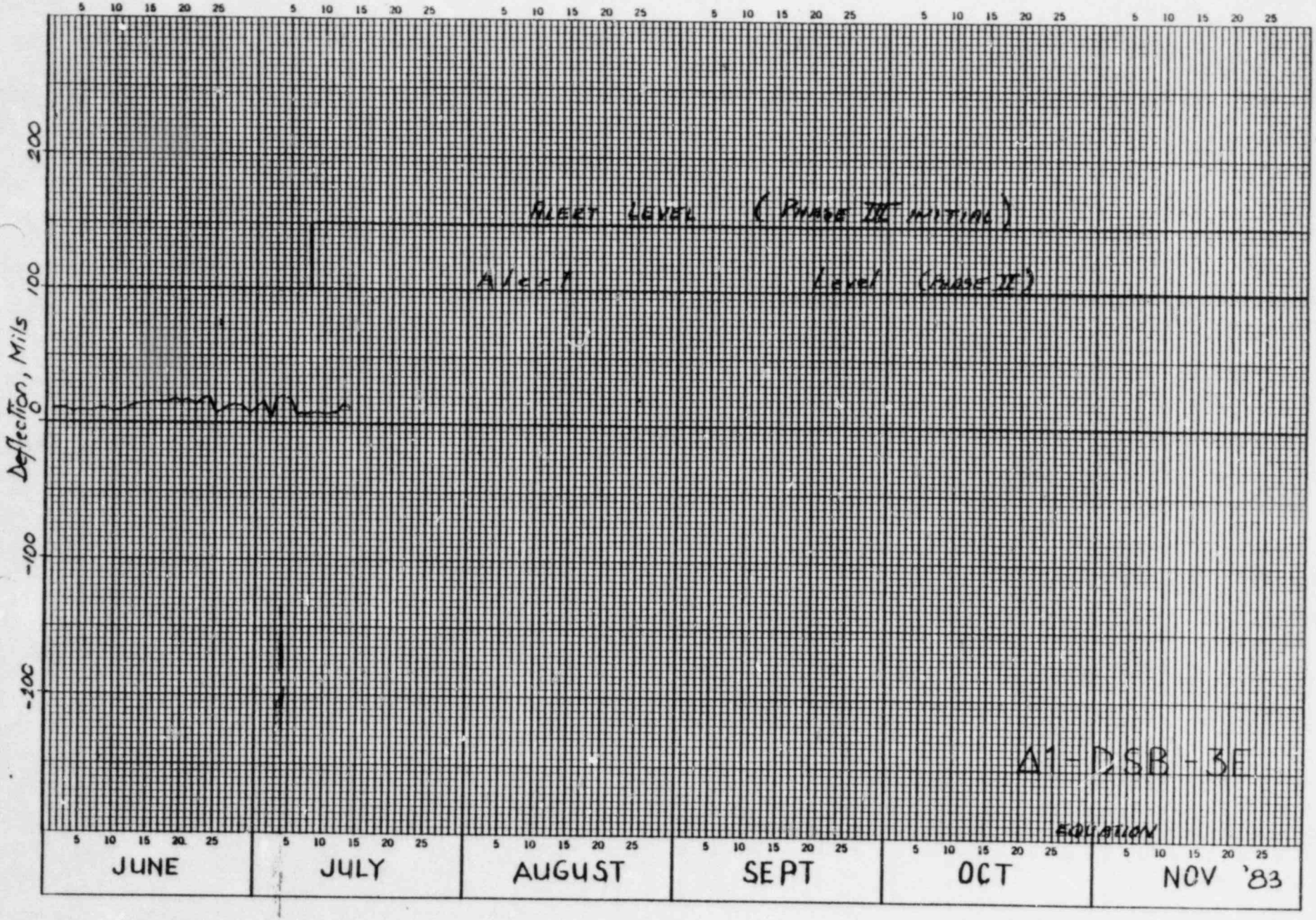
46 2610

46

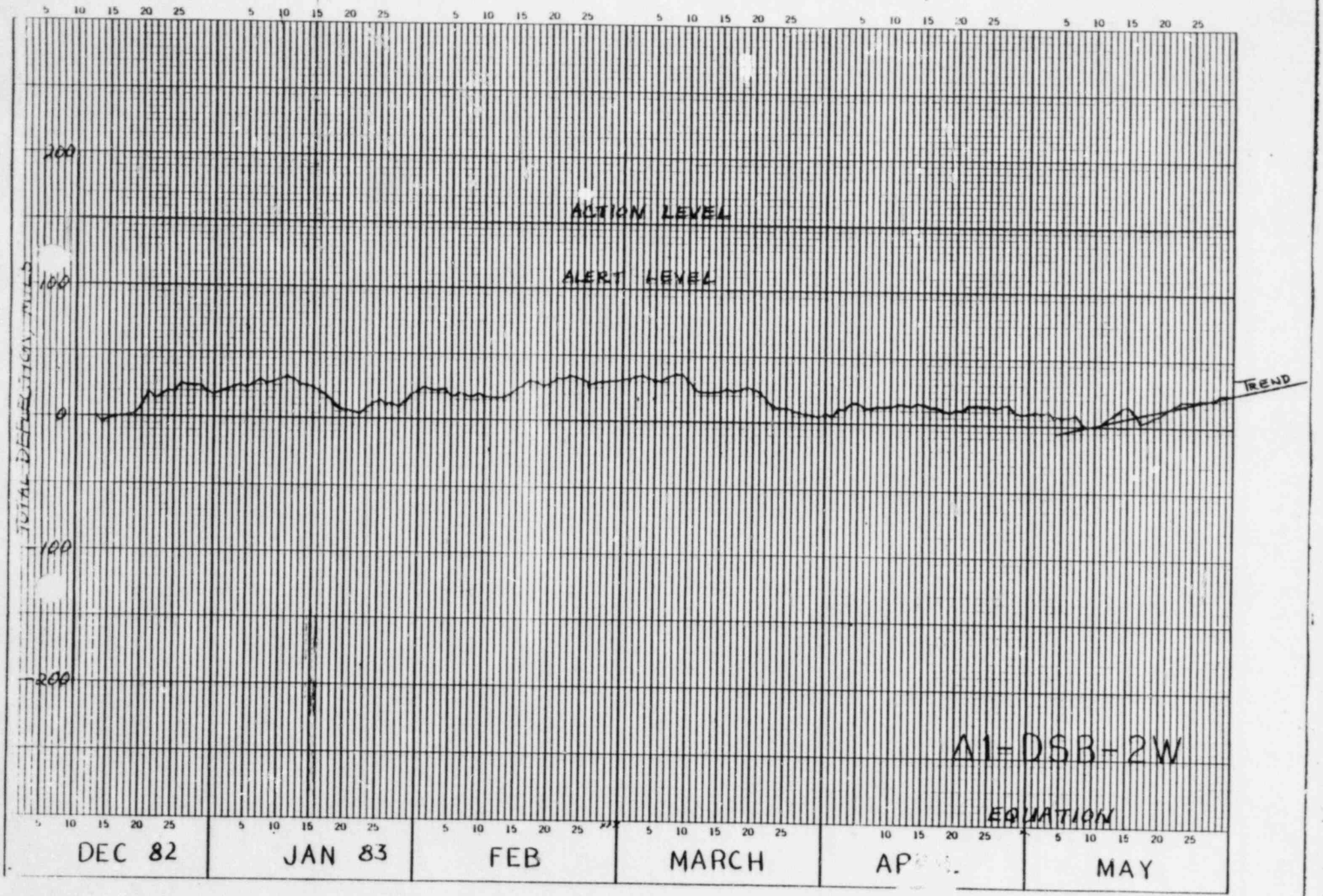


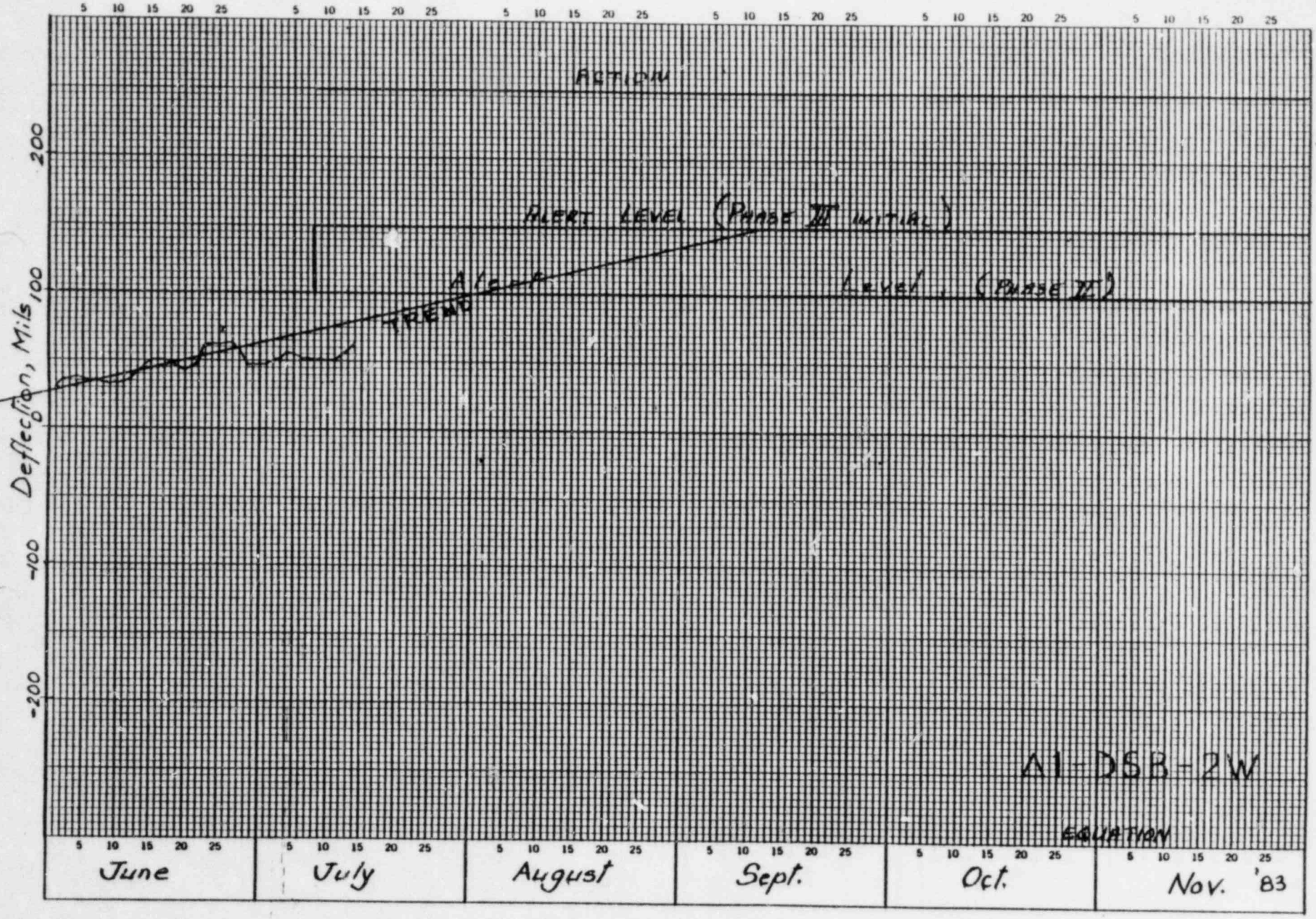


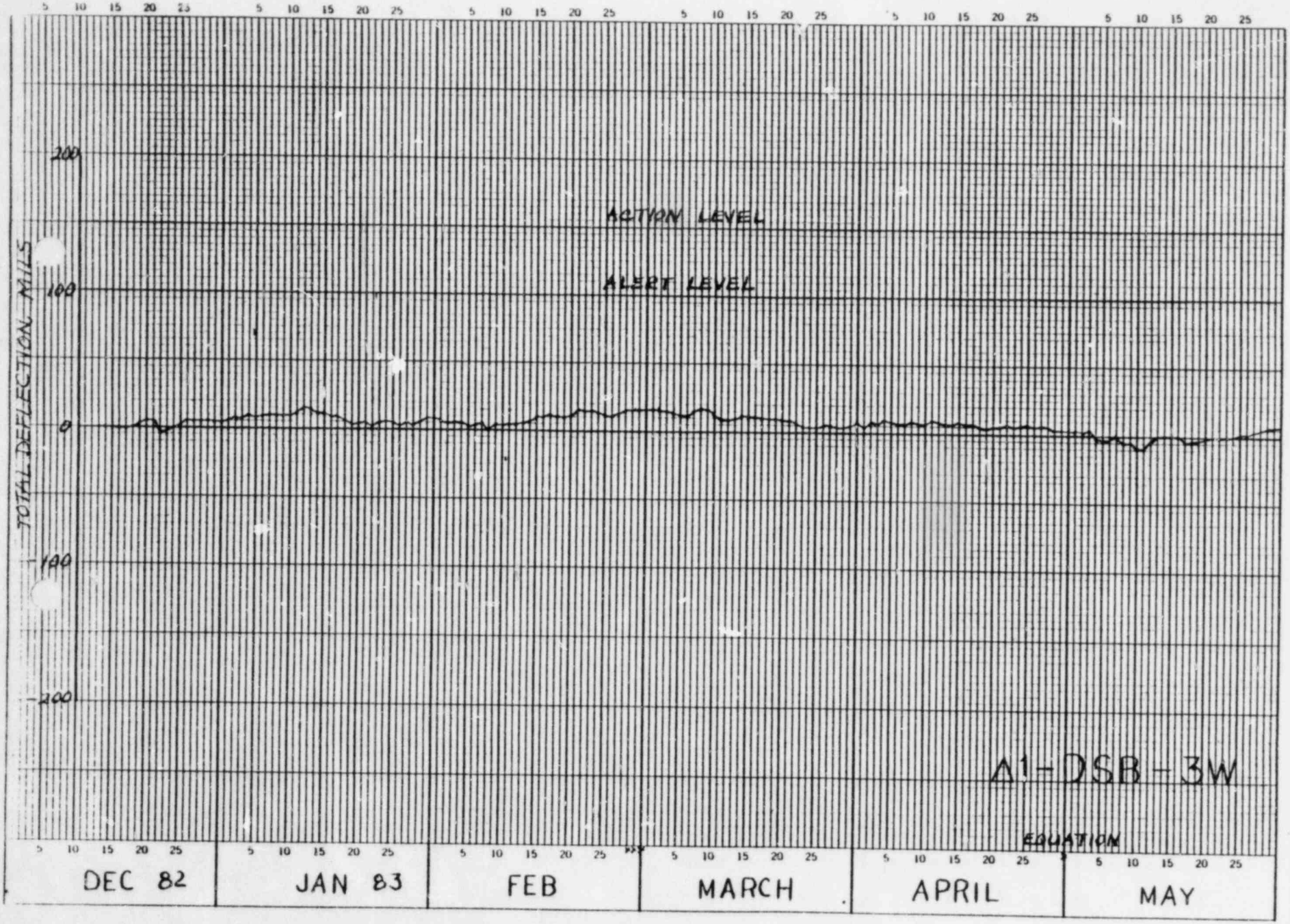

TOTAL DEFLECTION MILS
200
100
0
-100
-200
ACTION LEVEL
ALERT LEVEL
Δ1-DSB-3E
EQUATION
DEC 82
JAN 83
FEB
MARCH
APRIL
MAY

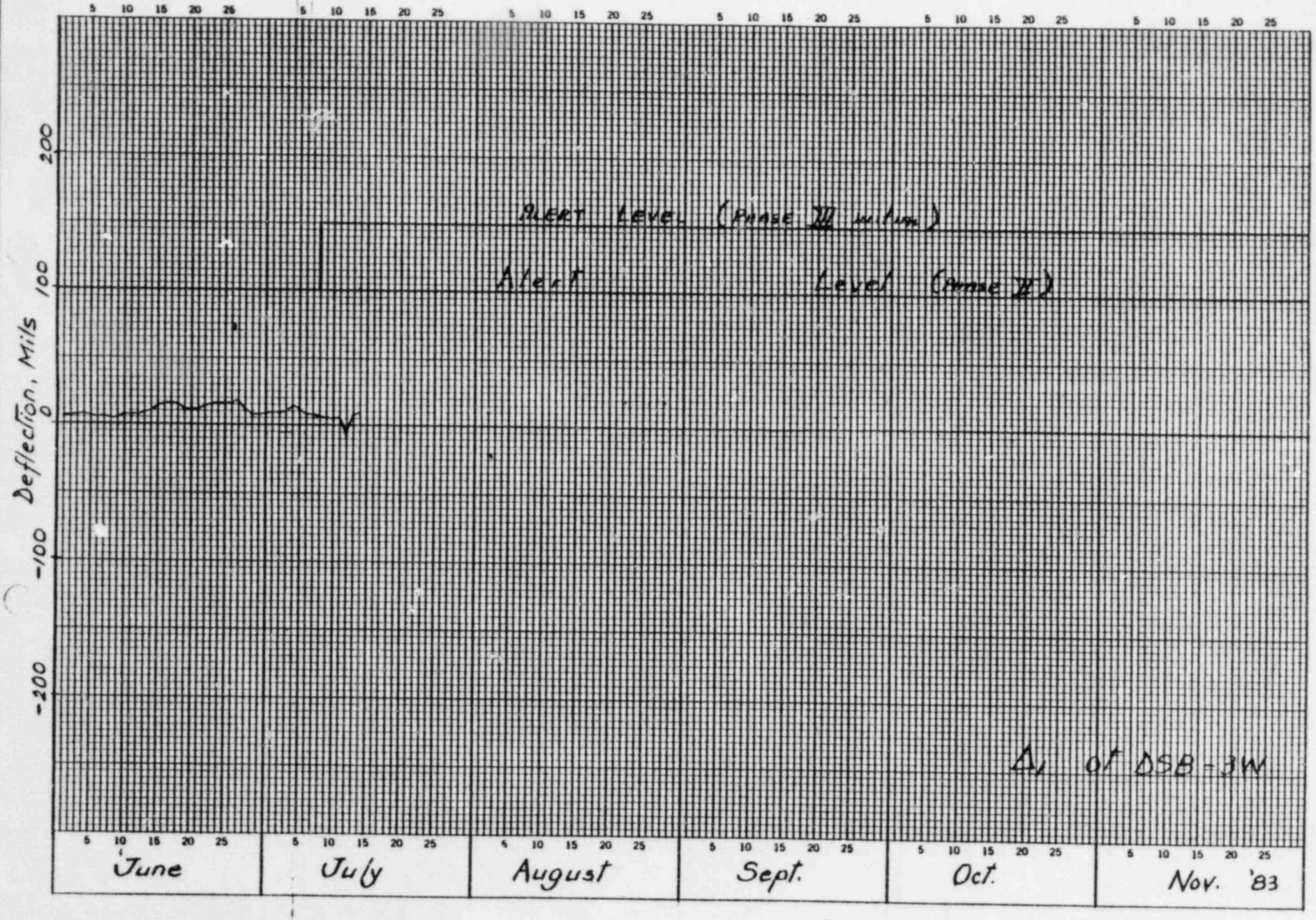


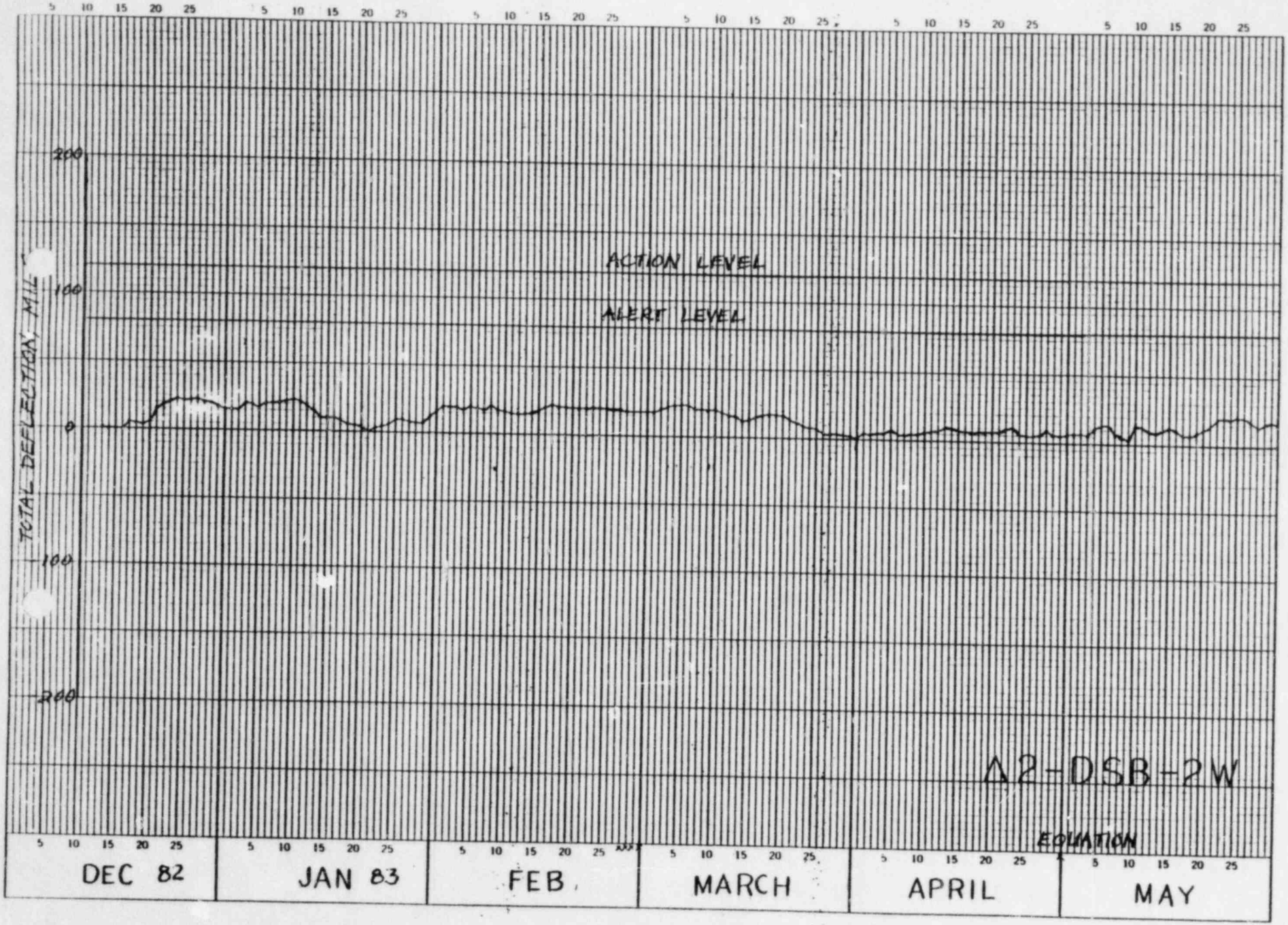
K·E 6 MONTHS BY DAYS X 120 DIVISIONS
KEUFFEL & ESSER CO MADE IN U.S.A.
46 2610



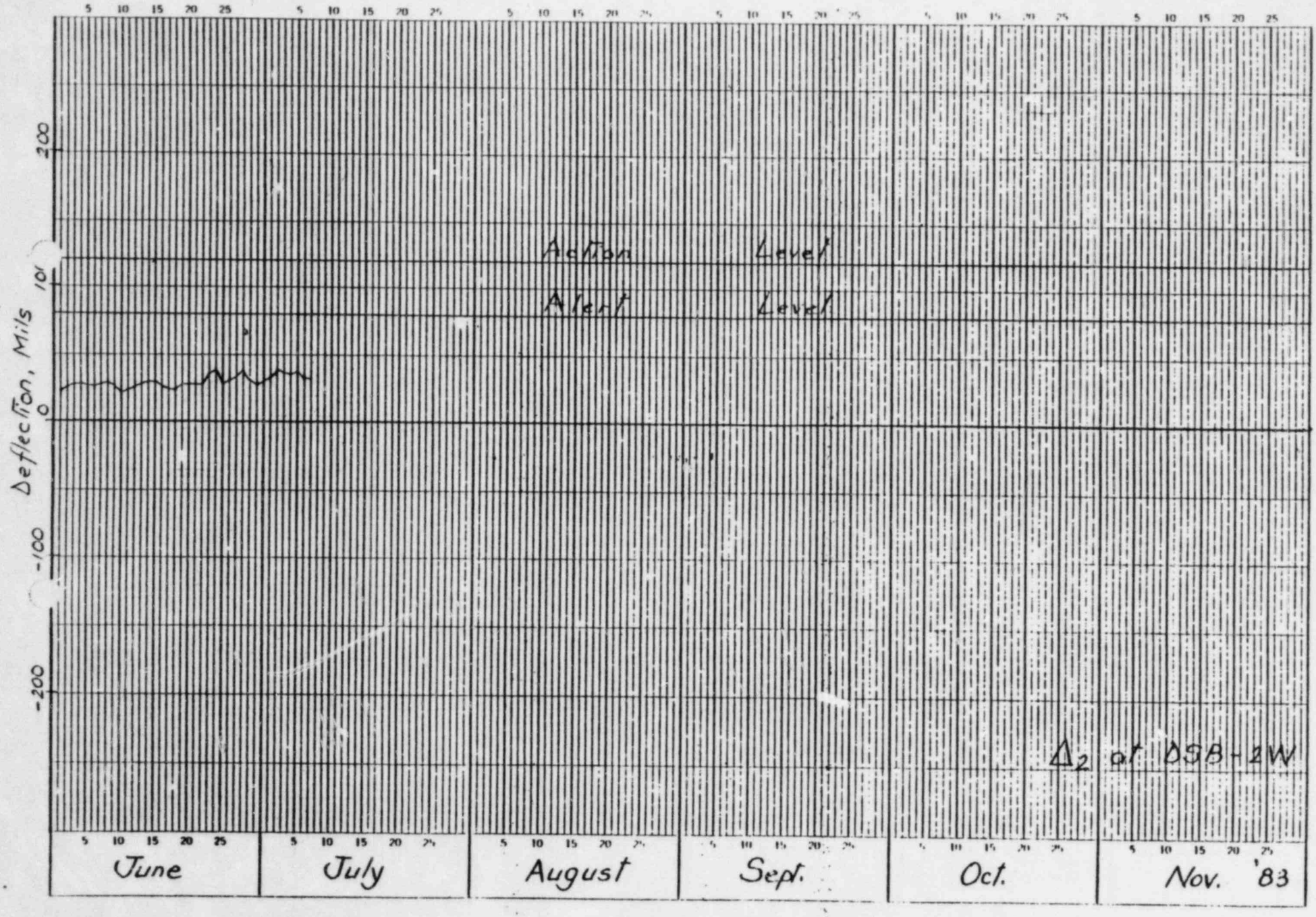

ACTION
ALERT LEVEL (PHASE III INITIAL)
ALERT LEVEL (PHASE II)
TREND
Deflection, Mils
200
100
0
-100
-200
A1-DSB-2W
EQUATION
June
July
August
Sept.
Oct.
Nov. '83

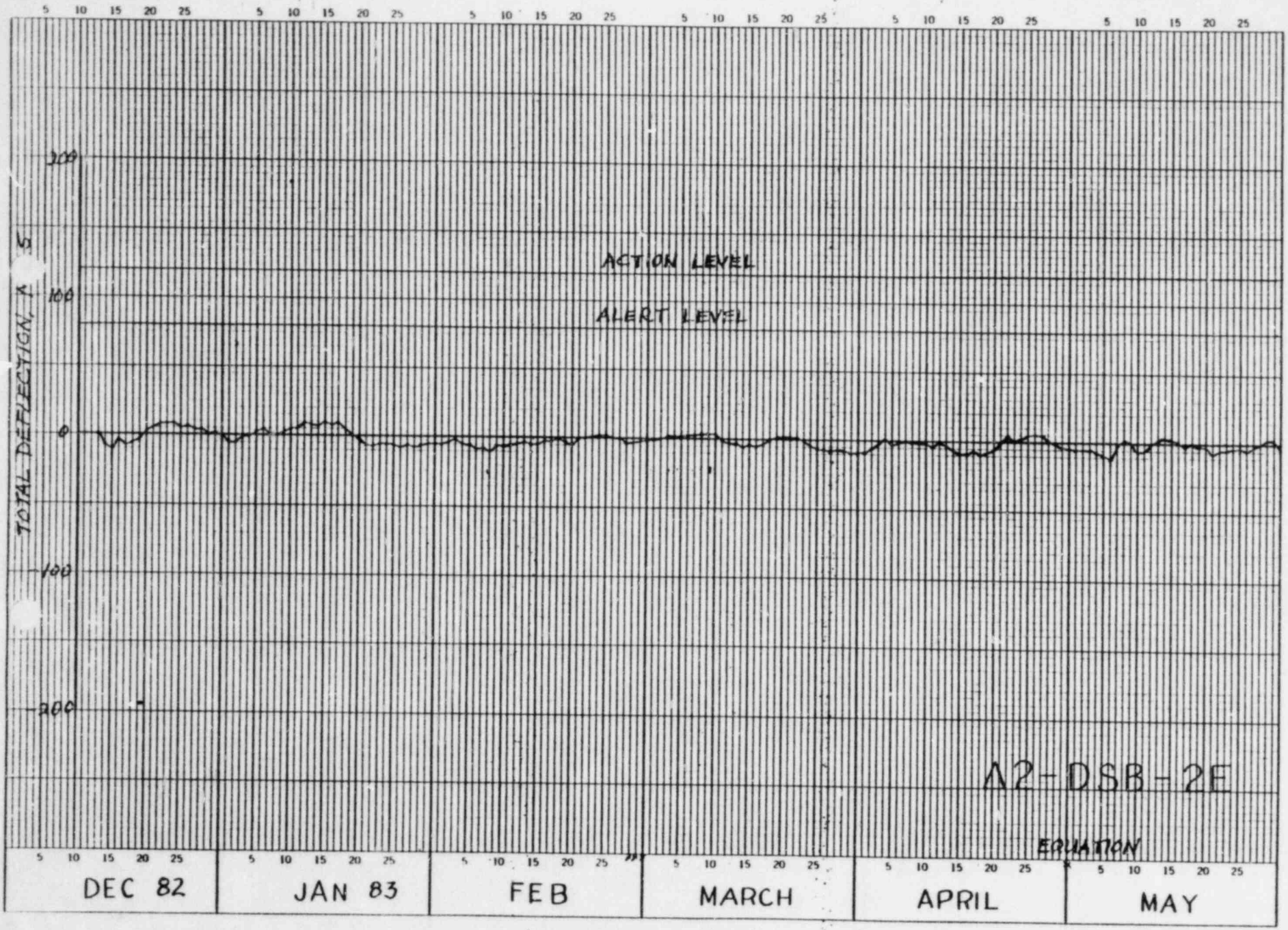

TOTAL DEFLECTION MILLS
200
100
0
-100
-200
ACTION LEVEL
ALERT LEVEL
Δ1-DSB-3W
EQUATION
DEC 82
JAN 83
FEB
MARCH
APRIL
MAY




5 10 15 20 25
200
100
0
100
200
TOTAL DEFLECTION, MIL
ACTION LEVEL
ALERT LEVEL
Δ2-DSB-2W
EQUATION
DEC 82
JAN 83
FEB
MARCH
APRIL
MAY

55




TOTAL DEFLECTION, Δ
300
100
0
-100
-300
ACTION LEVEL
ALERT LEVEL
Δ2-DSB-2E
EQUATION
DEC 82
JAN 83
FEB
MARCH
APRIL
MAY

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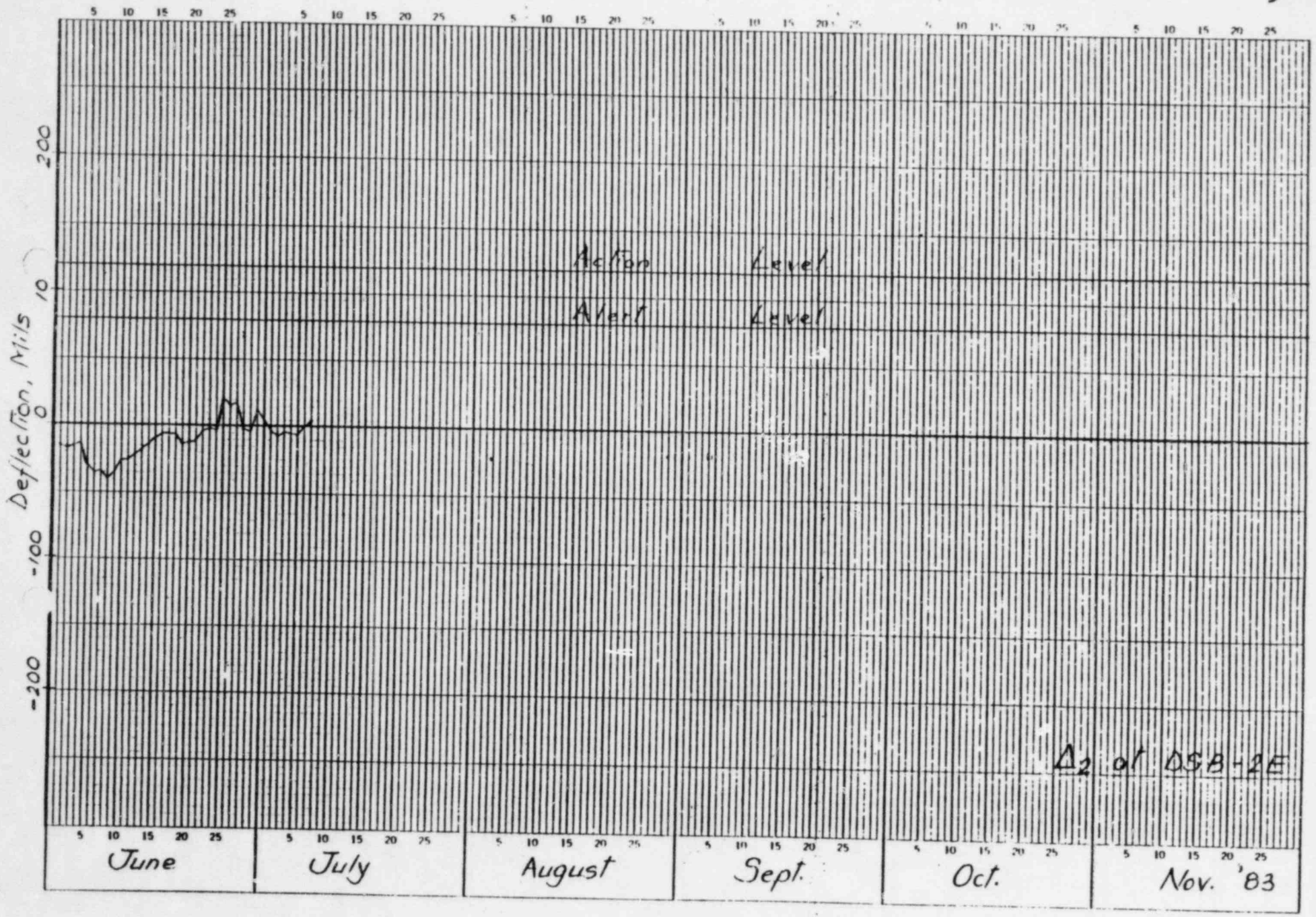

46 2610

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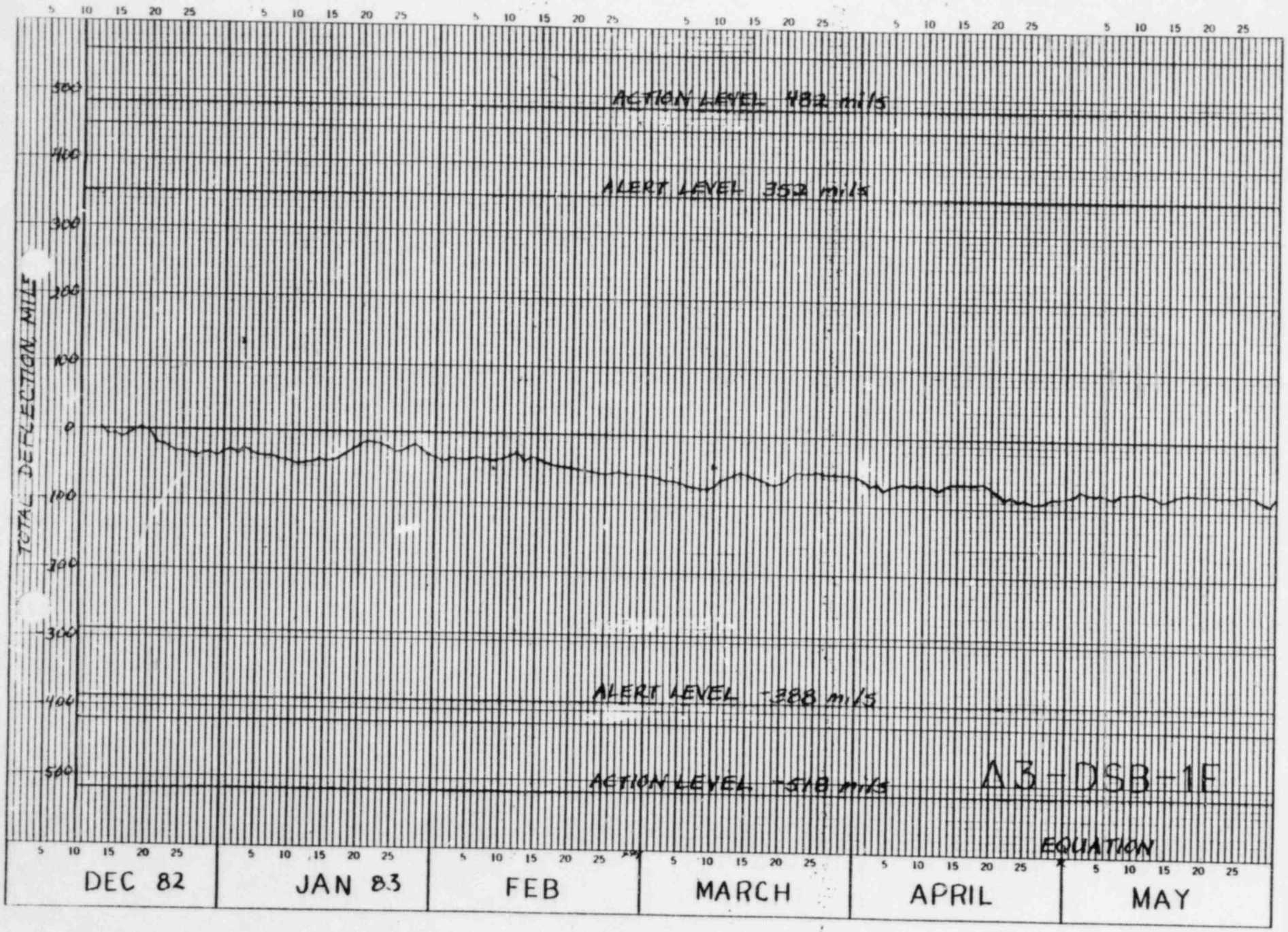
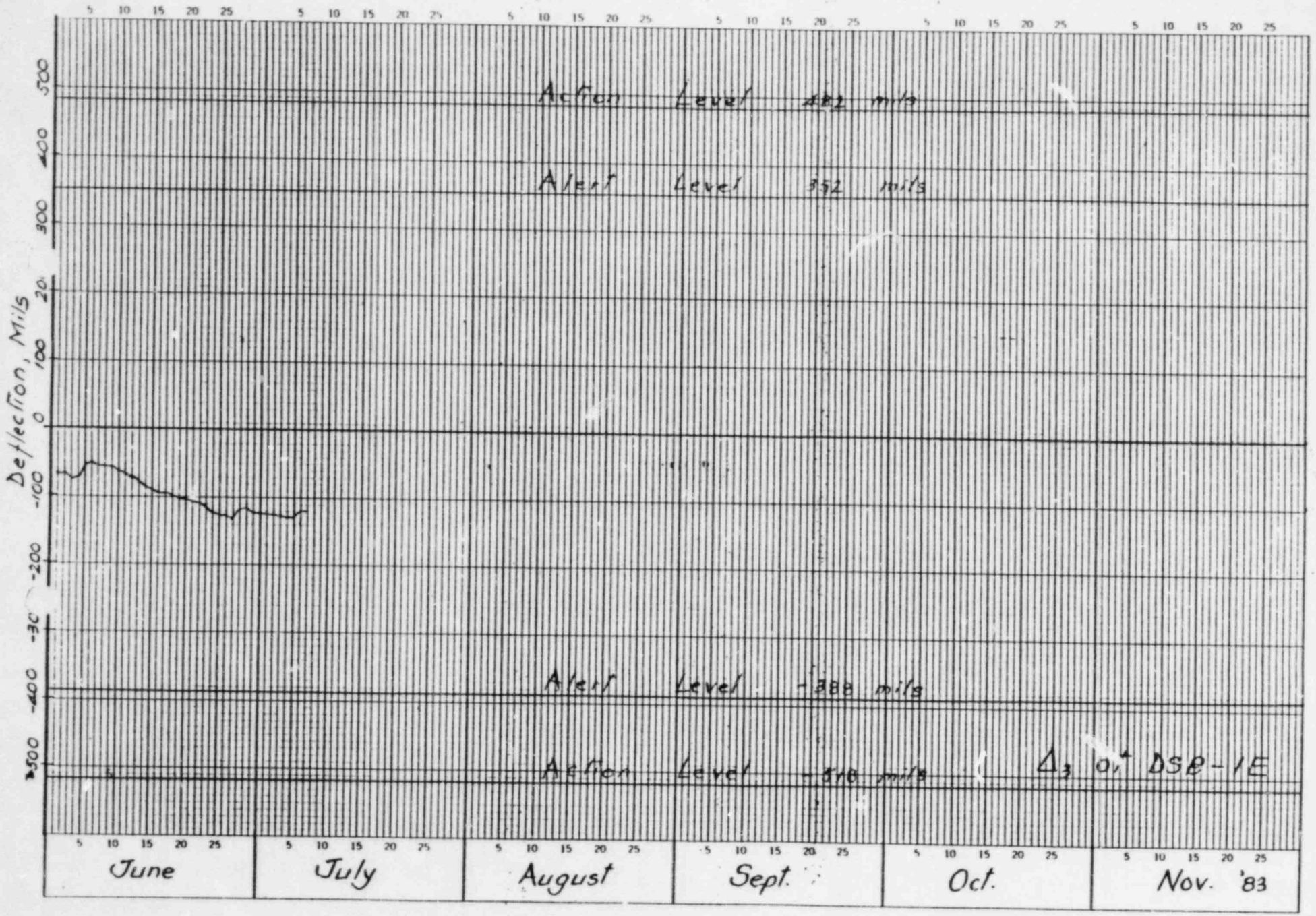


46 2610

59



K·E 6 MONTHS BY DAYS X 120 DIVISIONS
KEUFFEL & ESSER CO

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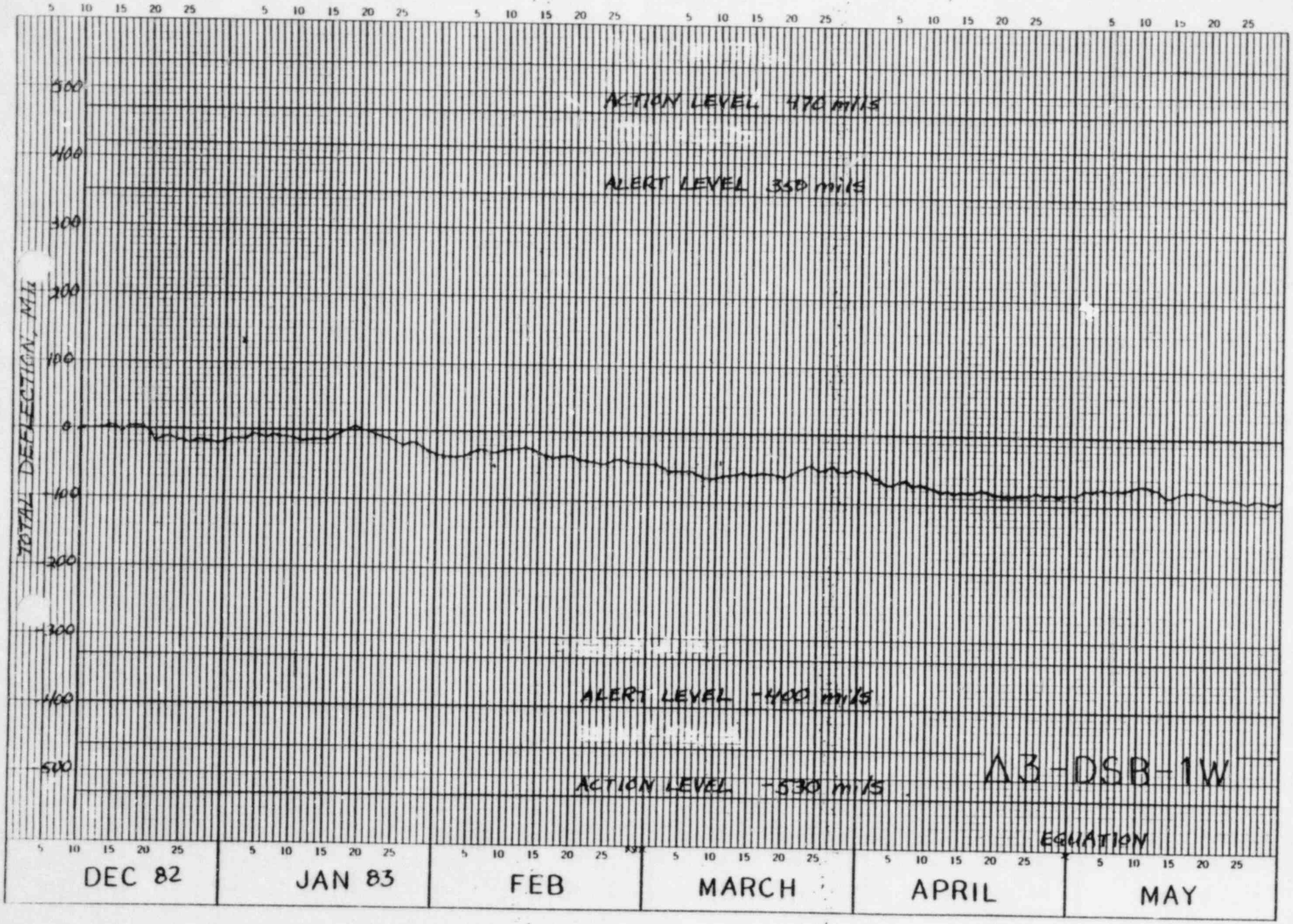
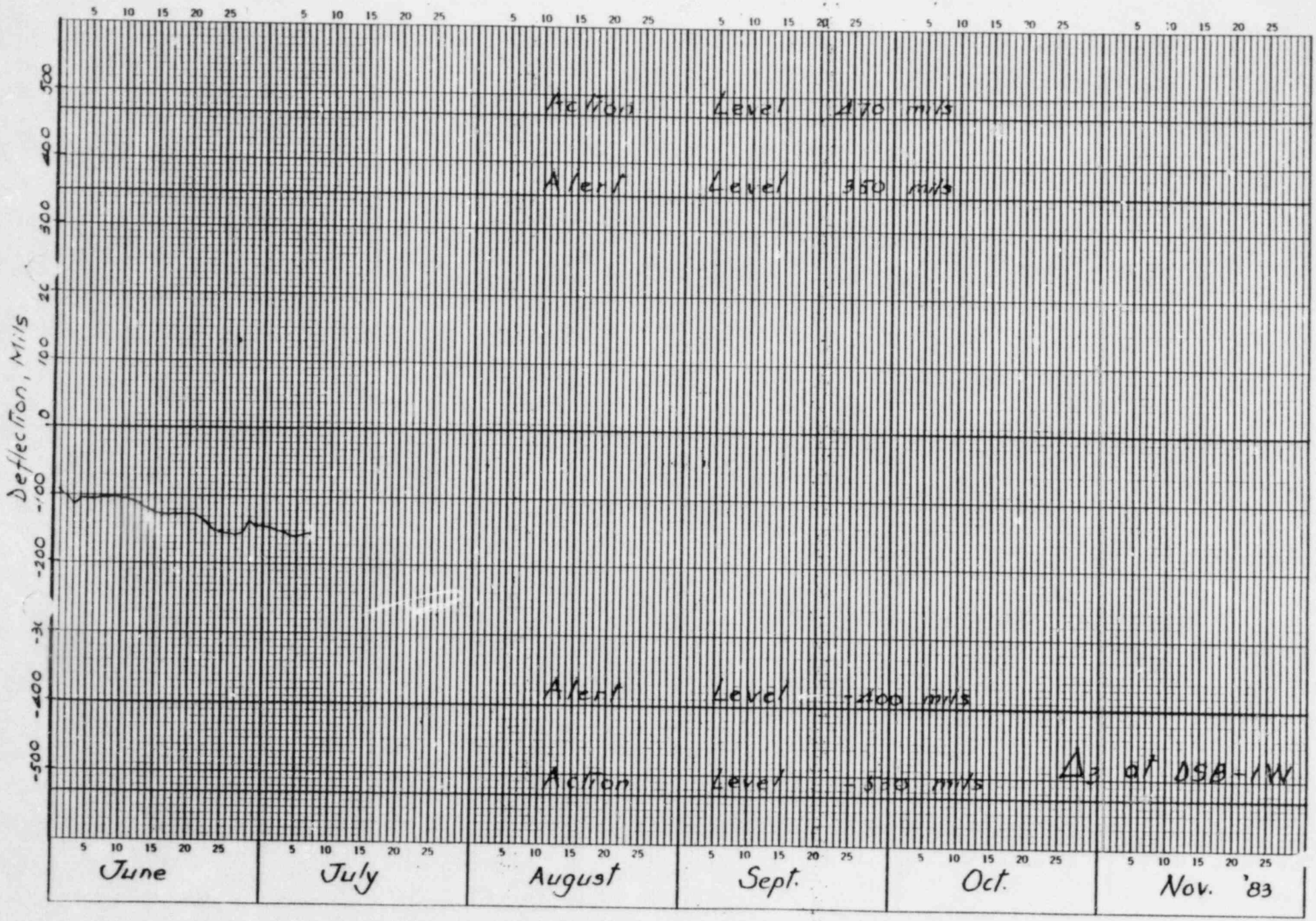
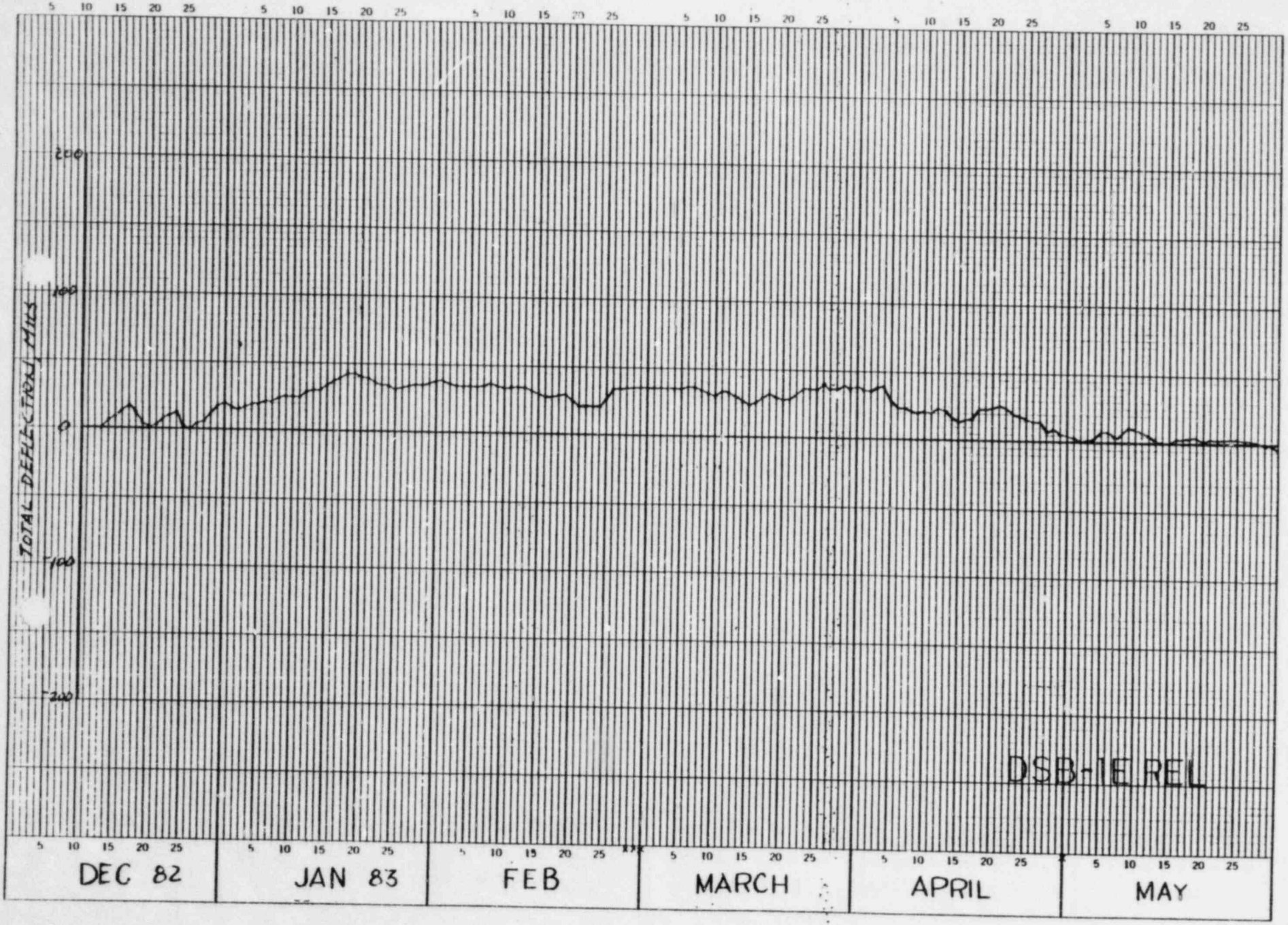


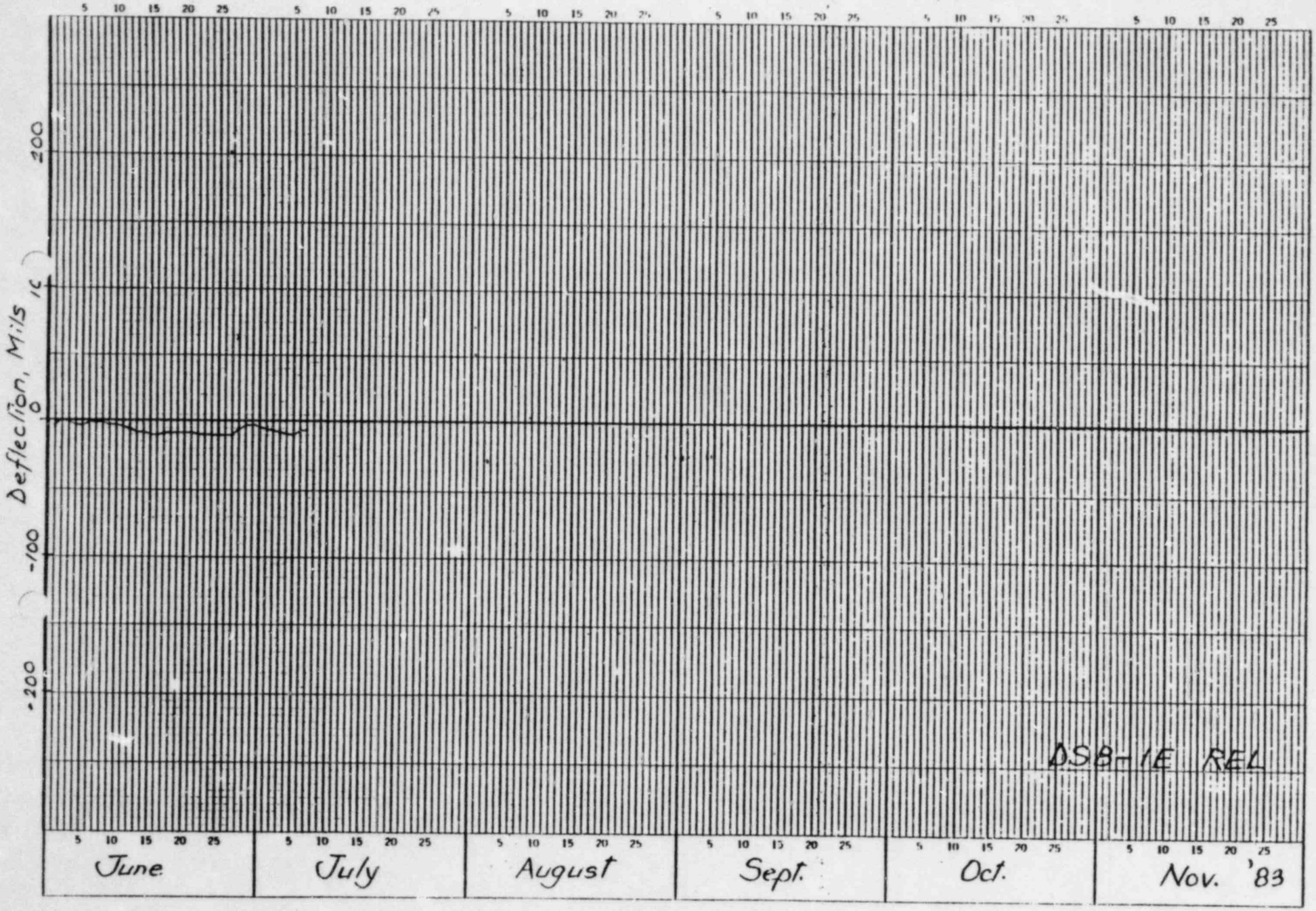
46 2610

61




TOTAL DEFLECTION, MILS
200
100
0
100
200
DSB-1E REL
DEC 82
JAN 83
FEB
MARCH
APRIL
MAY

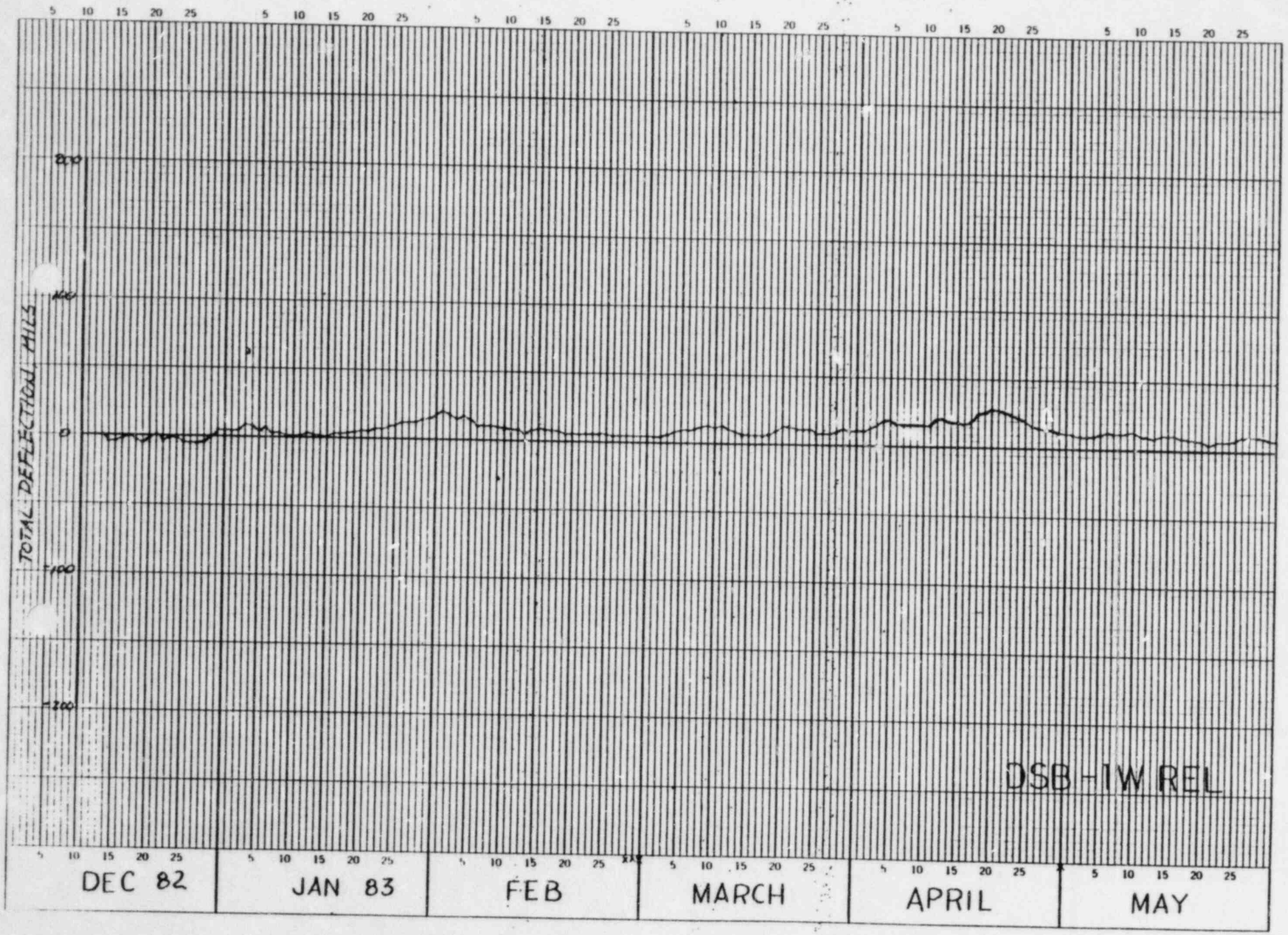
63



K·E 6 MONTHS BY DAYS X 120 DIVISIONS
KEUFFEL & ESSER CO MADE IN U.S.A.

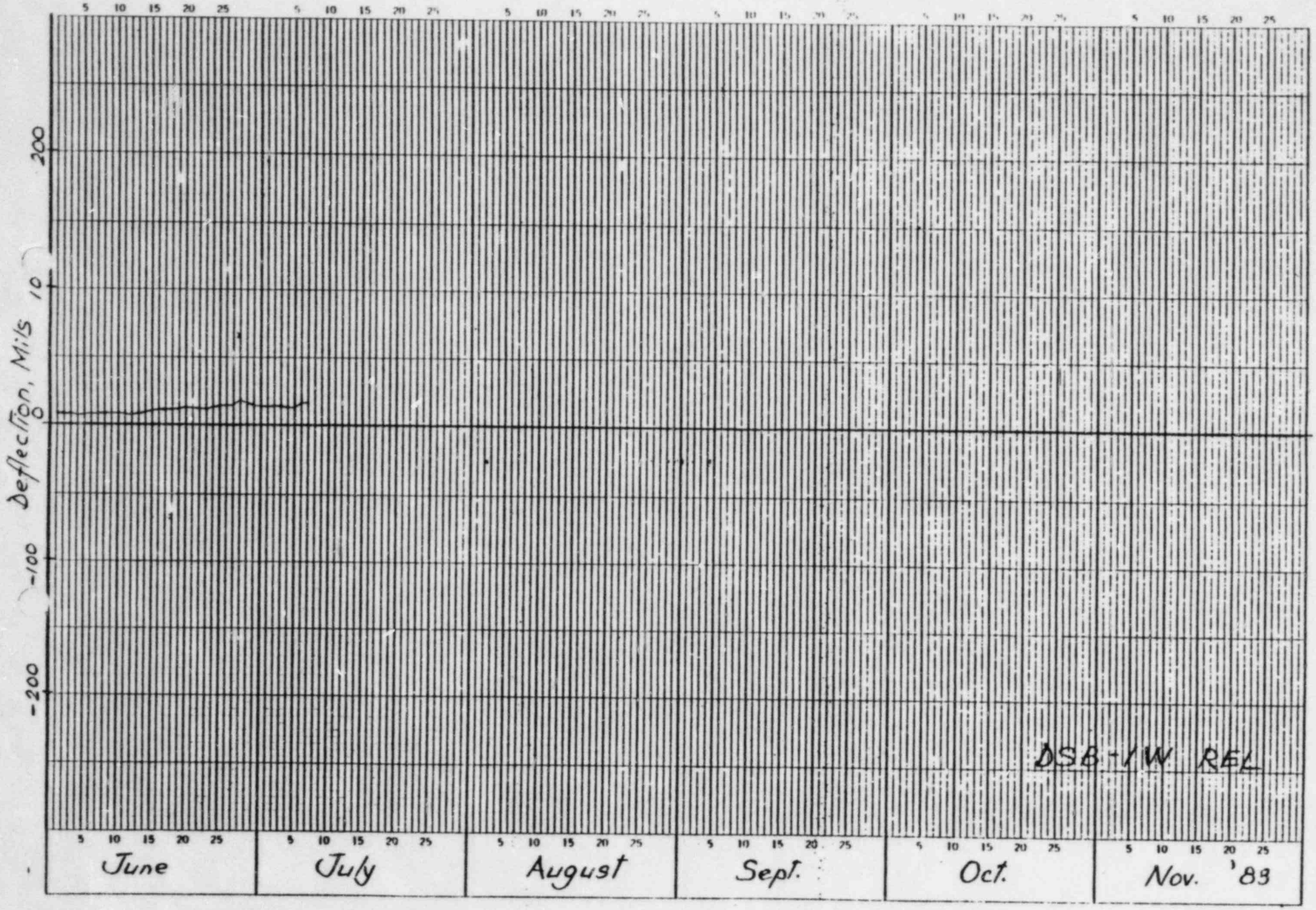
46 2610

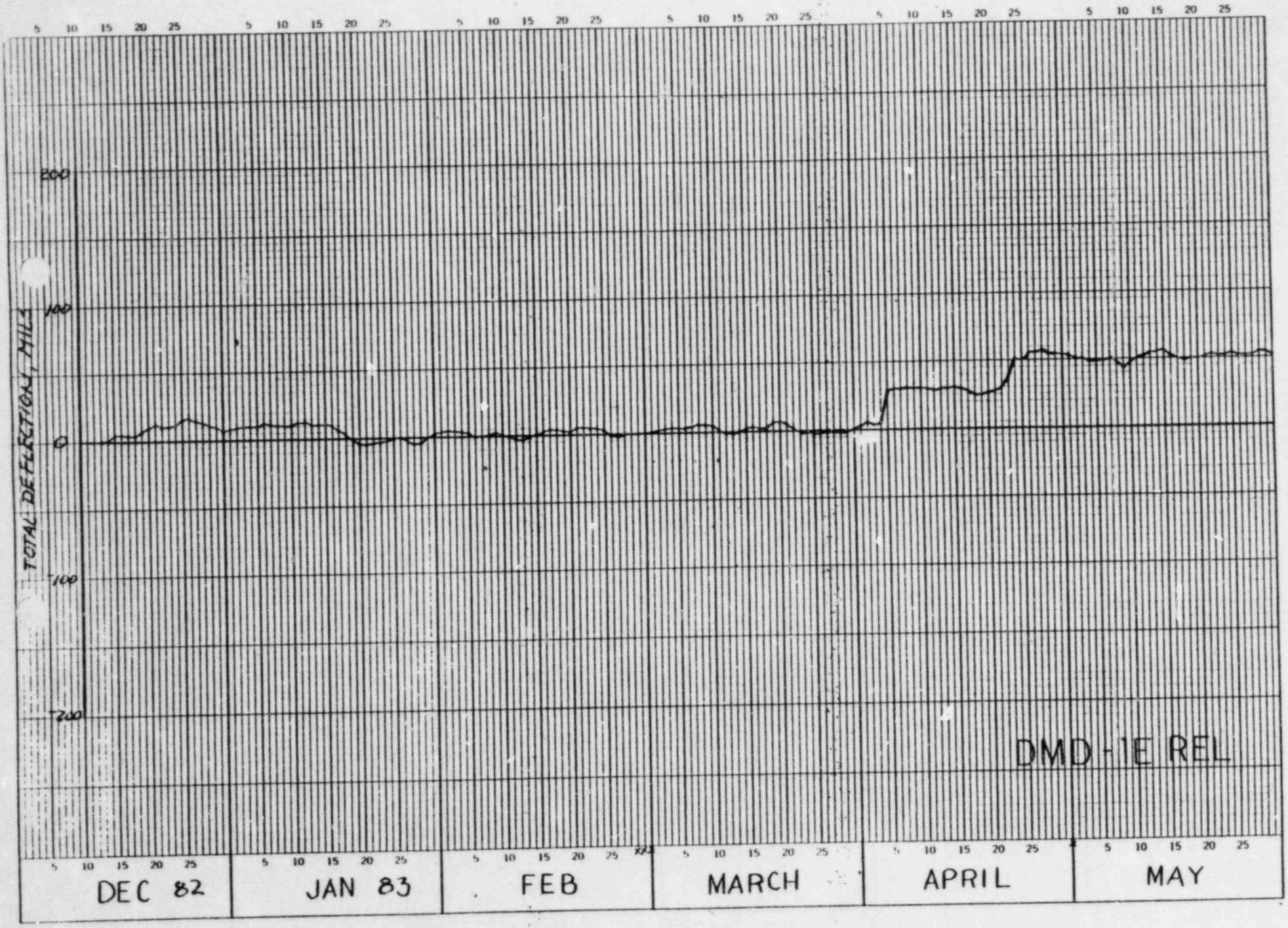
64



46 2010

65





46 2610

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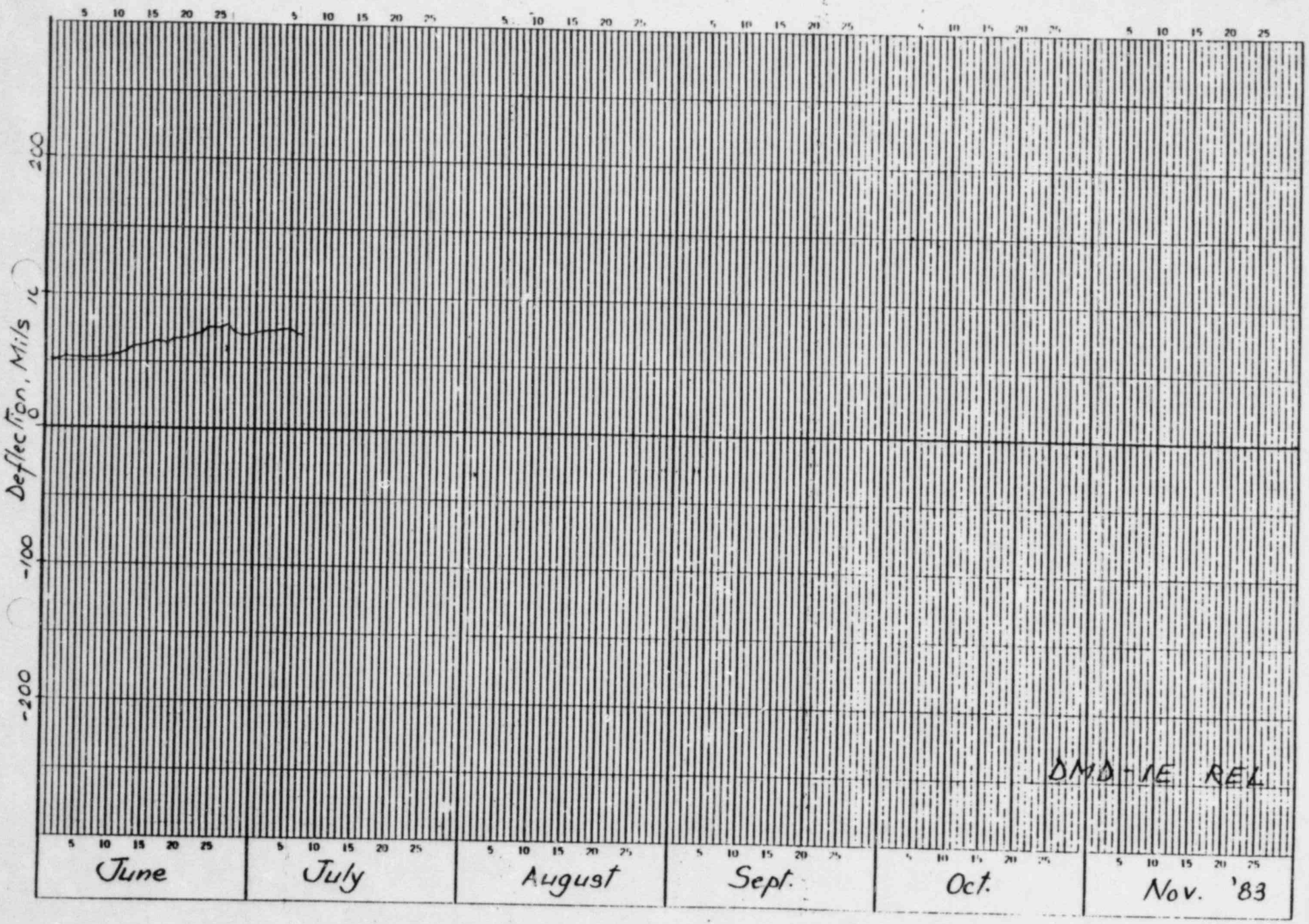
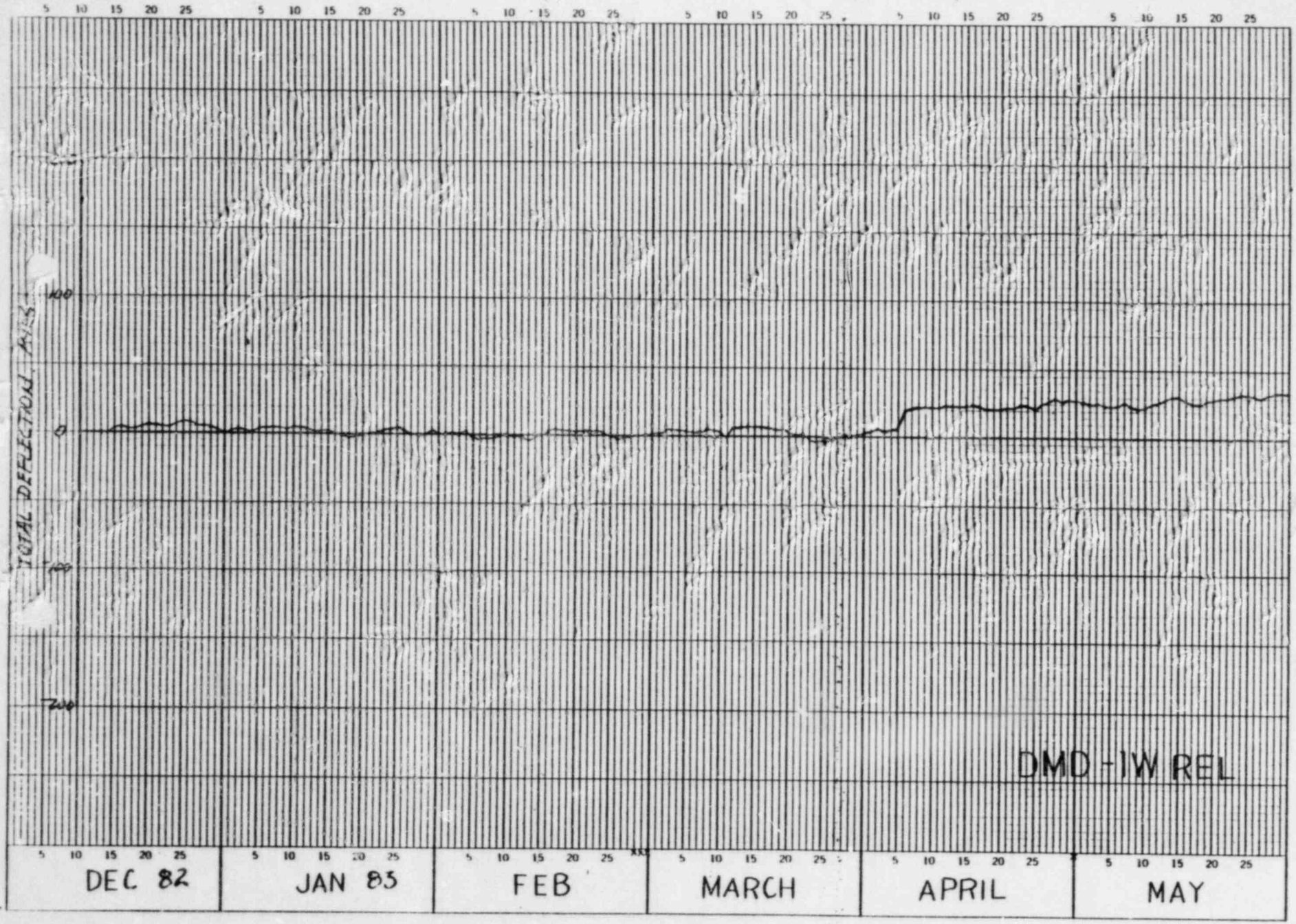
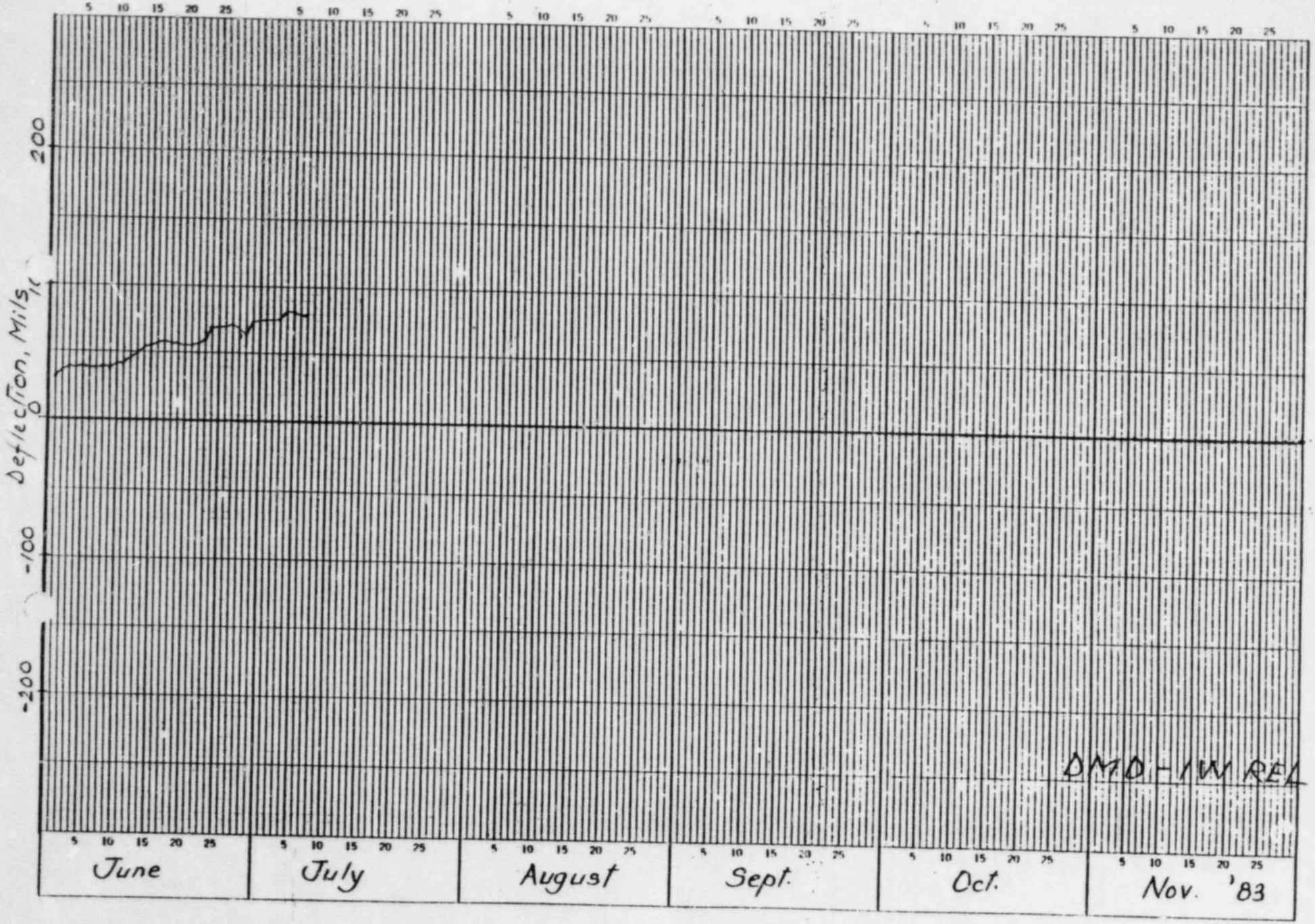
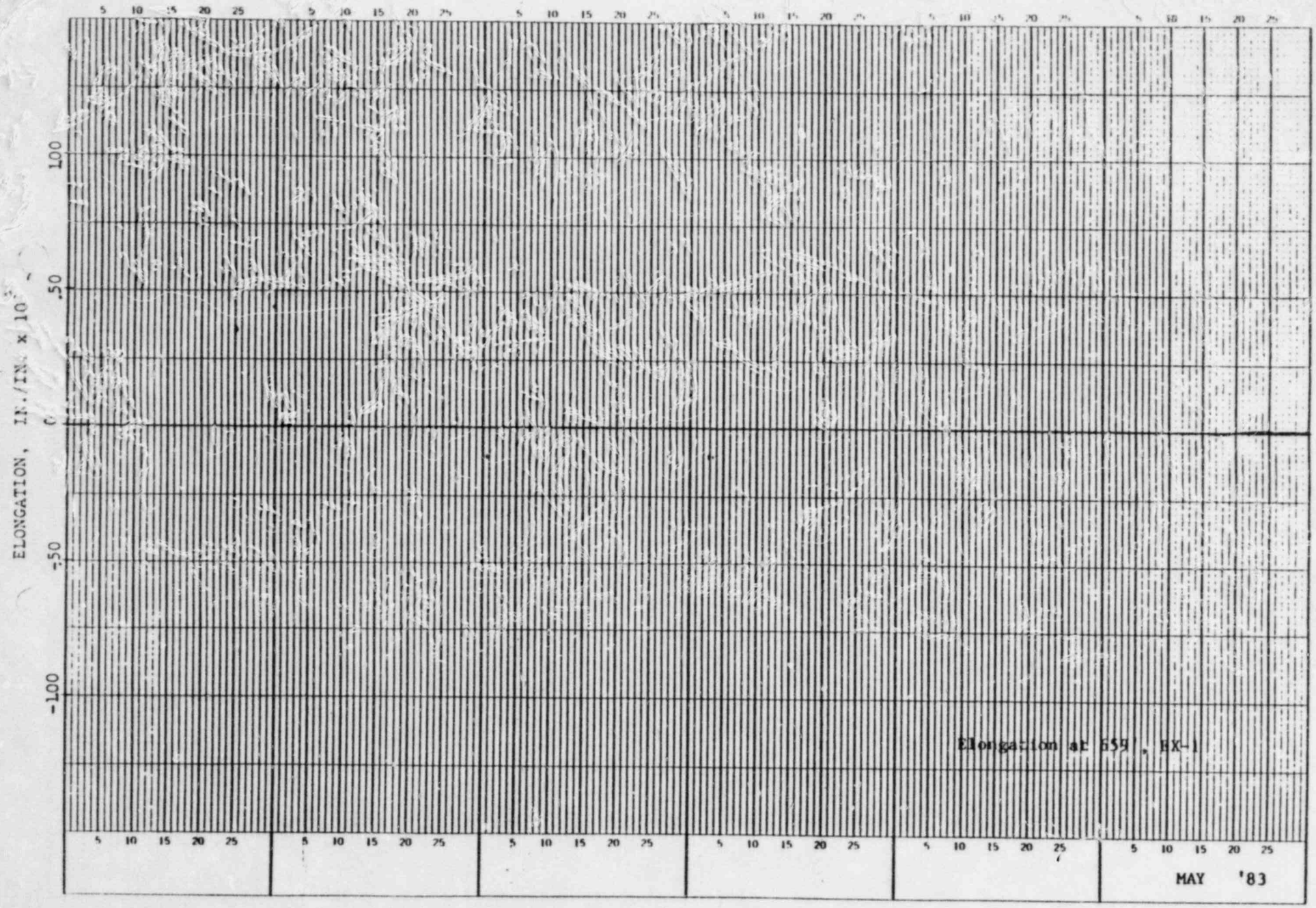



TOTAL DEFLECTION, MILS
100
0
-100
-200
DMD-1W REL
DEC 82
JAN 83
FEB
MARCH
APRIL
MAY

46 2610

69

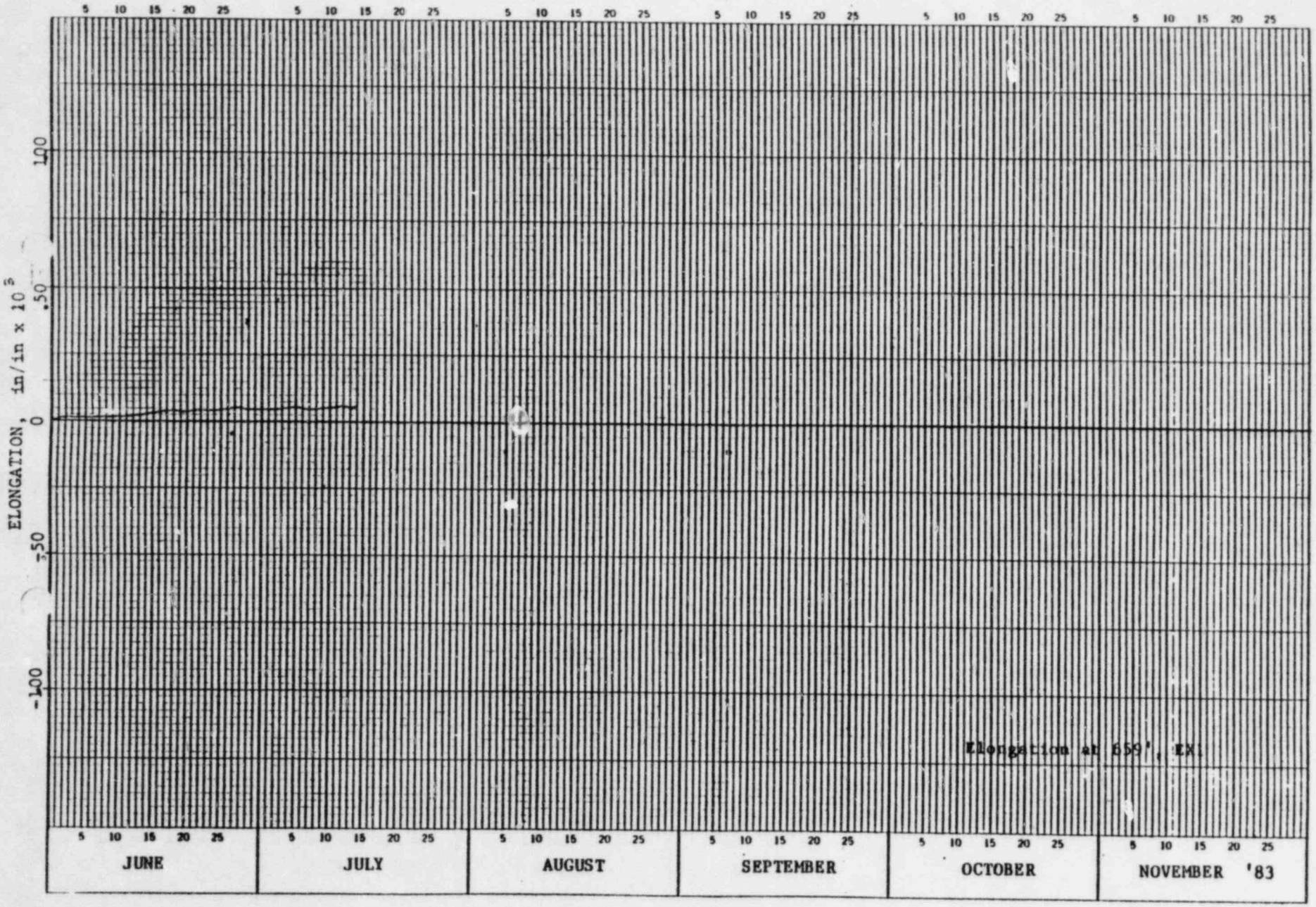



ELONGATION, IN./IN. x 10⁻³
100
50
0
-50
-100
5 10 15 20 25
Elongation at 65°F, HX-1
MAY '83

K·E 6 MONTHS BY DAYS X 120 DIVISIONS
KEUFFEL & ESSER CO MADE IN U.S.A.

46 2610

71



K·E 6 MONTHS BY DAYS X 120 DIVISIONS
KEUFFEL & ESSER CO

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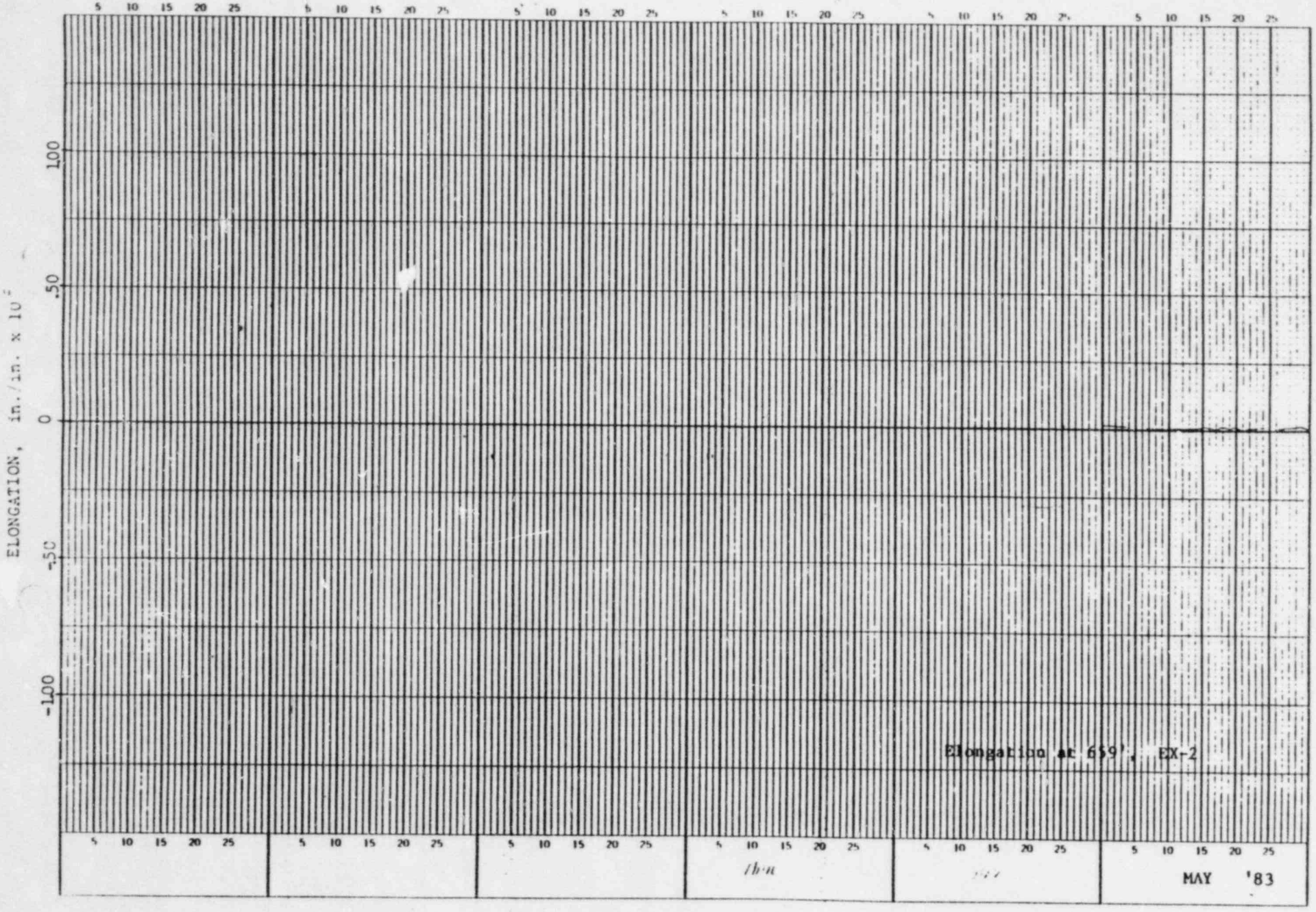
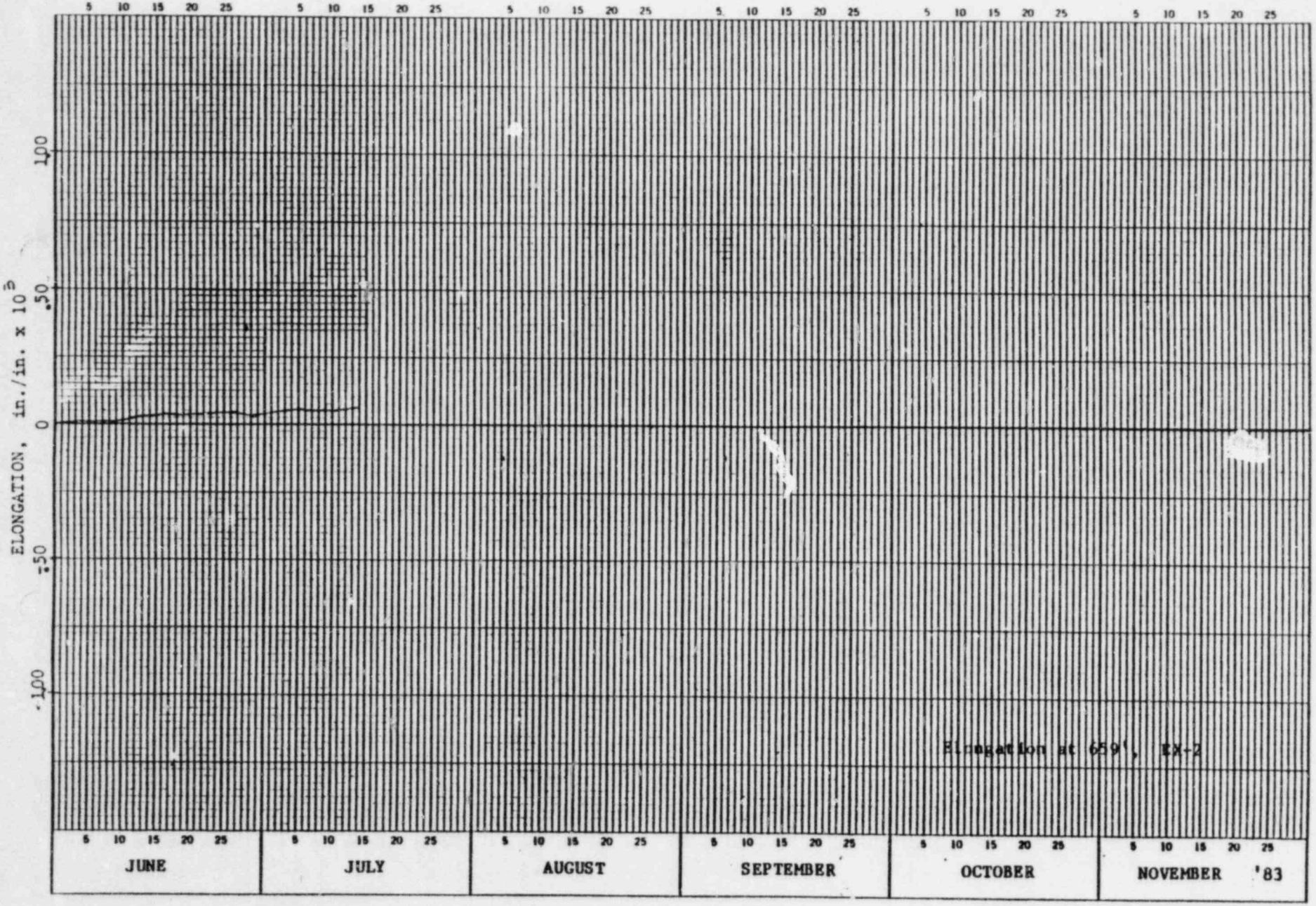
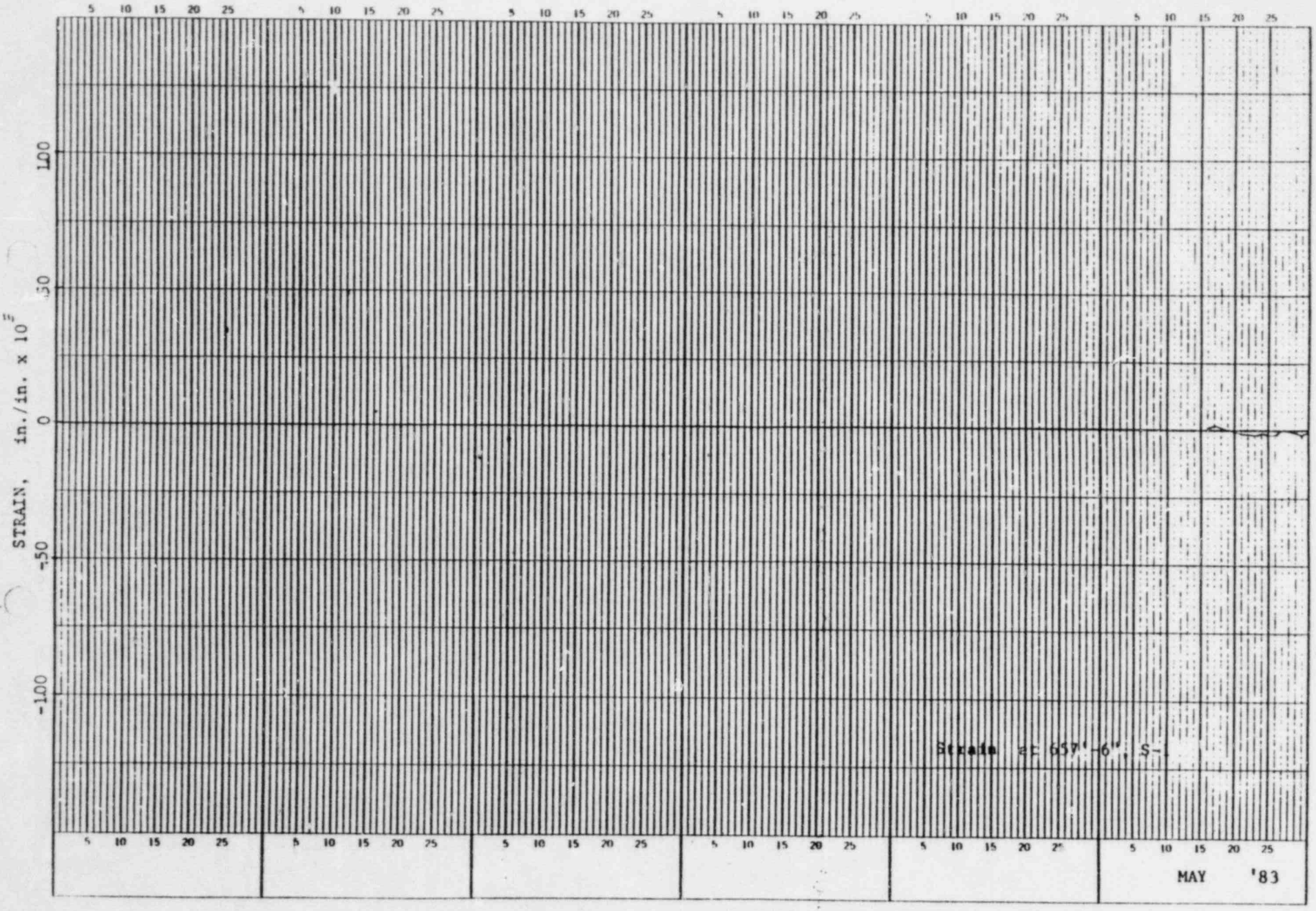
12.




ELONGATION, in./in. x 10⁻³
100
50
0
-50
-100
5 10 15 20 25
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER '83
Elongation at 659', EX-2

K·E 6 MONTHS BY DAYS X 120 DIVISIONS
KEUFFEL & ESSER CO

46 2610



K·E 6 MONTHS BY DAYS X 120 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

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11

5 10 15 20 25 5 10 15 20 25 5 10 15 20 25 5 10 15 20 25 5 10 15 20 25 5 10 15 20 25

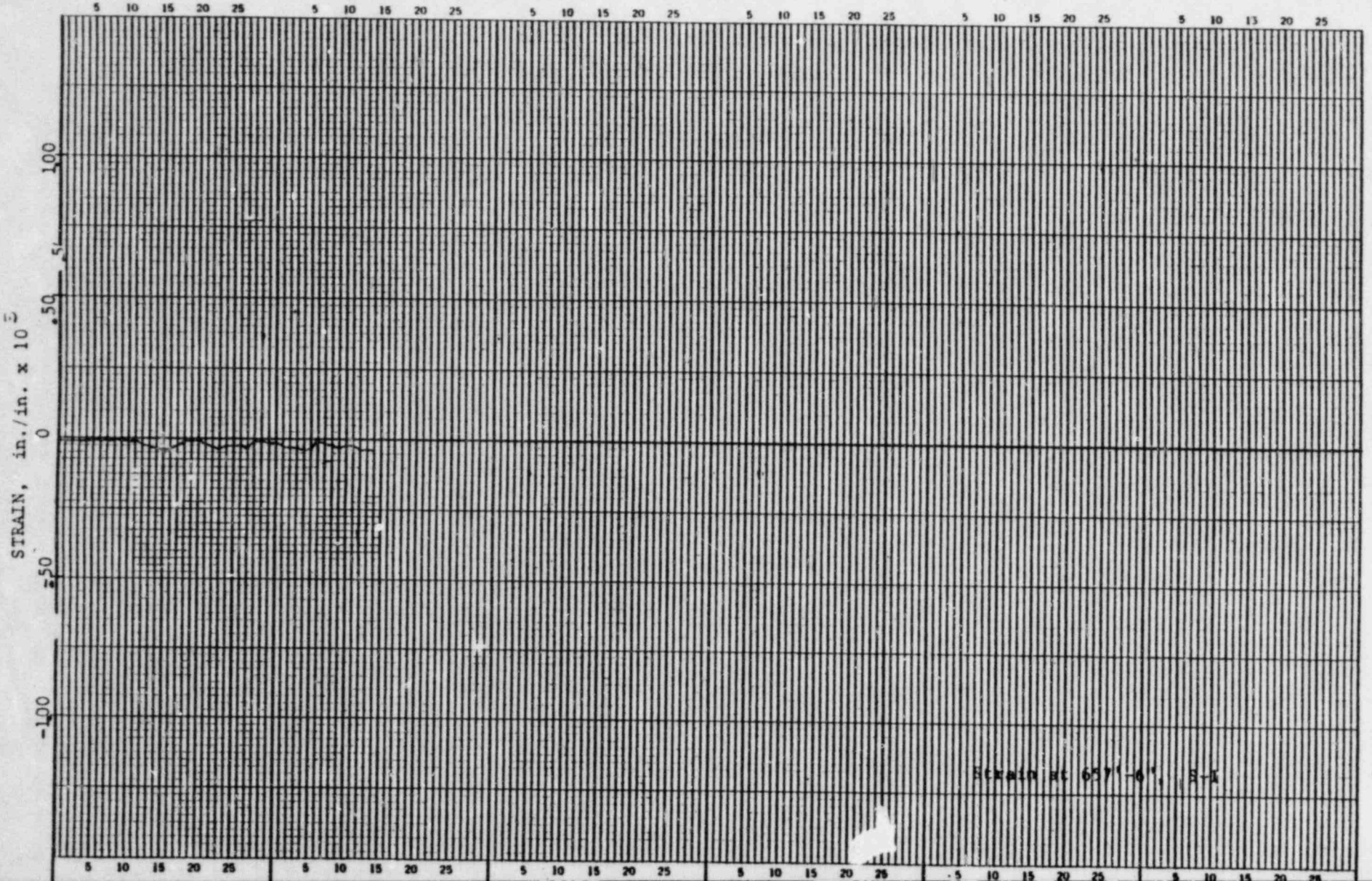
K·E 6 MONTHS BY DAYS X 120 DIVISIONS

46 2610

K·E 6 MONTHS BY DAYS X 120 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 2610

15



Send to DMB 7/19/83

Consumers Power Company

J A Mooney
Executive Manager
Midland Project Office

General Offices: 1945 West Parnall Road, Jackson, MI 49201 • (517) 788-0774

Orig + 3

July 15, 1983

Mr J J Harrison
U S Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

MIDLAND ENERGY CENTER GWO 7020
REMEDIAL SOILS CONCRETE MIX
File: 0485.16 UFI: 42*05*22*04 Serial: CSC-6791
12*32

Per our previous discussions concerning concrete mix designs for the remedial soils work, we are submitting the attached summaries of three mix designs for your information (E-5-C, E-5C-H, C-6C-H). Please note that E-5C-H and C-6C-H include the use of high range water reducing admixture (Superplasticizer). The concrete used utilizing the superplasticizer will be consolidated by vibration per existing project Specification C-195.

We will not be using these mix designs until we receive your concurrence. We would like to discuss any comments you may have as soon as you have reviewed the mix design information.

JAMooney

JAM/RHW/klm

Attachments

29pp

JUL 19 1983

8307070204

Attached are summaries for review of mix design as follows:

Page #1 - Summary sheet giving the details of the mixes added.

Page #2 - Plot of test data on which the mixes are based.

Attachment A - Test results for the graph for E-5C mix (i.e. 6000 psi @ 60 days without HRWR).

Attachment B - Test results for the graph for:

E-5C-H mix (i.e. 6000 psi @ 60 days with HRWR).

C-6C-H mix (i.e. 4000 psi @ 28 days with HRWR).

UNDERPINNING OBSTRUCTION

SUMMARY SHEET

		E-5C	E-5C-H	C-6C-H
1.	Comp. Strength (f'c)	6,000 psi	6,000 psi	4,000 psi
2.	Working Limit slump	3"	8" (Note 1)	8" (Note 1)
3.	Inadvertency Margin	Note 2	Note 2	Note 2
4.	Rejection Limit Slump	-	-	-
5.	MIX-PROPORTIONS:			
	(a) Cement	828 lb	705 lb	658 lb
	(b) Sand	1,090 lb	1,314 lb	1,350 lb
	(c) 3/4". stone	1,870 lb	1,849 lb	1,849 lb
	(d) Water	307 lb	268 lb	270 lb
	(e) W/RA	- PER MANUFACTURER'S INSTRUCTIONS -		
	(f) HRWR	-	Note 1	Note 1
	(g) AIR-ENTRAINING AGENT	- NONE	→	→

NOTE 1: MIXES DESIGNATED WITH H ARE TO BE USED WITH HRWR. CONCRETE WITH A BASE SLUMP OF 2±1" WILL HAVE A RESULTING SLUMP NOT EXCEEDING 8" AFTER ADDING HRWR. THE QUANTITY OF HRWR TO BE ADDED IS AS FOLLOWS:

BASE SLUMP OF CONCRETE	QUANTITY OF HRWR TO BE ADDED (MAX.)
1"	75 oz
2"	65 oz
3"	55 oz

NOTE 2: INADVERTENCY MARGIN IS A TOLERANCE IN SLUMP OF UPTO 1" ABOVE WORKING LIMIT FOR INDIVIDUAL BATCHES, PROVIDED THE AVERAGE FOR ALL BATCHES OR THE MOST RECENT 10 BATCHES TESTED, WHICHEVER IS LESS, DOES NOT EXCEED THE WORKING LIMIT.

Page #2
Plot for E-SOH Mix (Good psi) (60 days)
Plot for E-SC Mix (Good psi) (60 days)
Plot for C-C-H (Good psi) (60 days)
H - Standard for HRWR.

Attachment – A

Check the trial mixes for slump requirement

"Trial batches shall be designed to produce a slump within 1 inch of the maximum permitted ..."

(ACI 301 Sect 3.8.2.1)

"slump with ± 1 in of max permitted by specification" (ACI 301-72 Sect 3.8.2.1)

For conservative use ± 3/4

Batch ticket	Mix	slump	Strength psi	W/c ratio
62964	1	3"	7307	0.34
62965	2	3"	7310	0.371
62966	3	3½	7077	0.373
62967	4	3½	6877	0.379
62968	5	3½	7067	0.385

The mix will have slump of 3"

The acceptable range of slump = 3 − 0.75 = 2 1/4"

to 3 + 0.75 = 3 3/4"

All mixes are acceptable.

E-5C

BECHTEL POWER CORPORATION
MIDLAND NUCLEAR POWER PLANT JOB 7220

REPORT OF CONCRETE CYLINDERS

1. Placement Identification: N/A LETTER REF. 106621			2. Date Placed: 3-4-83
3. Placement Location: ALLIED CONCRETE			
3A. PLANT DATA — Source: ALLIED CONCRETE		Cement Brand & Type: AETNA TYPE I	
4. Mix: #1	5. Class: I	6. "Q" List: ☑ Yes ☐ No	7. Required Strength: 4000 PSI EF 3-5-83 At 28 Days
8. Test Data At: BATCH PLANT (CM)	9. Unit Weight ASTM-C-138-74: 152.98 Lbs/Ft³		10. Yield: 26.73
11. Moisture: Sand ASTM-C-566-67(72): 1.0 %	Stone 1: 0.6 %	Stone 2: N/A %	12. Water/Cement & Pozzolan Ratio: 0.35 Max 0.35 Act.
13. Ticket No.: 62964	14. Truck No.: 18	15. Time of Testing: 0918 Hrs at 2 Yards	16. Time of Molding: 0918 Hrs
17. Slump ASTM-C-143-74: 3 Inches	18. Air Content ASTM-C-231-75: 1.4 %	19. Temp: Concrete: 64 °F	20. Temp: Air: 38 °F
21. Curing: (TC) BT W/M			
22. Initial Curing ASTM-C-31-69; Therm/Due Date: °F 40 To 71 °F* 3661 3-5-83		23. Stripped ASTM-C-31-69: 3-5-83 At 0755 Hrs	24. Initials: RG LH, RB

COMPRESSIVE STRENGTH DATA ASTM-C-39-71

25. Specimen Identification	26. Date Molded	27. Date Tested	28. Age	29. Total Load in Pounds	30. Actual Cyl Diam	31. Actual Cyl Area	32. Type of Break	33. Cure: Field	33. Cure: Lab	34. Strength PSI
SP1683 — 931	3-4-83	3-5-83	1	107,000	6.00	28.27	A	1	0	3,780
932	〃	〃	〃	106,000	6.01	28.37 HT+EV (28.15)	A	1	0	3,740
933	〃	3-5-83	1	109,000	5.99	28.18	A	1	0	3,870
934	〃	3-6-83	2	119,000	6.00	28.27	A	1	1	4,210
935	〃	〃	〃	123,000	5.98	28.09	A	1	1	4,380
936	〃	3-6-83	2	127,500	6.00	28.27	A	1	1	4,510
937	〃	3-7-83	3	137,000	5.98	28.09	A	1	2	4,880
SP1683 — 938	3-4-83	3-7-83	3	134,000	6.00	28.27	A	1	2	4,740

35. Standard Cylinder: ☑ 6" x 12" ☐ Cube ☐ Core ☐ Other

40. Remarks: * INITIAL CURING OUT OF SPECIFICATION; JOHN GAYDOS, P.E., AND BOB WILSON, Q.C., NOTIFIED

36. Age (Days)	37. Tested By	38. Checked By	39. Reviewed by Q.C.
1	RTB LH	RH	NA 3-11-83
2	RH LH	RBB	
3	WA TE SF	RBB	

41. Laboratory Supervisor Signature: 42. Date:

Type of Breaks: A = Cone, Mortar Failure B = Cone, Aggregate Failure C = Shear, Mortar Failure D = Shear, Aggregate Failure E = Other

7220-QCF-39 Rev. 5

G/L 3213

UST-M-94 @ 7 UST-M-130 @ 14 UST-M-62 @ 60

BECHTEL POWER CORPORATION
MIDLAND NUCLEAR POWER PLANT JOB 7220

REPORT OF CONCRETE CYLINDERS

1. Placement Identification: NA REF. LETTER 10621				2. Date Placed: 3-4-83
3. Placement Location: ALLIED CONCRETE				
3A. PLANT DATA — Source: ALLIED CONCRETE			Cement Brand & Type: AETNA TYPE I	
4. Mix: #1	5. Class: I	6. "Q" List: ☒ Yes ☐ No	7. Required Strength: ~~4000~~ 4000 PSI ET 3-5-83 At 28 Days	
8. Test Data At: BATCH PLANT (cm)	9. Unit Weight ASTM-C-138-74: 152.98 Lbs/Ft³		10. Yield: 26.7	
11. Moisture: Sand ASTM-C-566-67(72): 1.0 %	Stone 1: 0.6 %	Stone 2: NA %	12. Water/Cement & Pozzolan Ratio: 0.35 Max 0.35 Act.	
13. Ticket No.: 62964	14. Truck No.: 18	15. Time of Testing: 0918 Hrs at 2 Yards	16. Time of Molding: 0918 Hrs	
17. Slump ASTM-C-143-74: 3 Inches	18. Air Content ASTM-C-231-75: 1.4 %	19. Temp: Concrete: 64 °F	20. Temp: Air: 38 °F	21. Initials: (TC), GT, WM
22. Initial Curing ASTM-C-31-69; Therm/Due Date: °F 50 To 71 °F; * 366 15-29-83	23. Stripped ASTM-C-31-69: 3-5-83 At 0755 Hrs			24. Initials: RG, LH, RB

COMPRESSIVE STRENGTH DATA ASTM-C-39-71

25. Specimen Identification	26. Date Molded	27. Date Tested	28. Age	29. Total Load in Pounds	30. Actual Cyl Diam	31. Actual Cyl Area	32. Type of Break	33. Cure: Field	33. Cure: Lab	34. Strength PSI
SP/SA3- 939	3-4-83	3-7-83	3	132,500	6.00	28.27	A	1	2	4,690
940		3-11-83	7	157,250	5.99	28.18	A	1	6	5580
941		〃	〃	159,500	6.00	28.27	A	1	6	5640
942		3-11-83	7	152,500	5.99	28.18	A	1	6	5410
943		3-18-83	14	173,500	6.00	28.27	A	1	13	~~6,140~~ 6,140
944		〃	〃	168,500	6.00	28.27	B	1	13	5,960
945		3-18-83	14	158,500	6.00	28.27	A	1	13	5,610
SP/SA3- 946	3-4-83	4-1-83	28	198,500	6.00	28.27	D	1	27	7020

35. Standard Cylinder: ☒ 6" x 12" ☐ Cube ☐ Core ☐ Other

40. Remarks: * INITIAL CURING OUT OF SPECIFICATION; JOHN GAYDOS, P.E. AND BOB WILSON, Q.C., NOTIFIED.

36. Age (Days)	37. Tested By	38. Checked By	39. Reviewed by Q.C.
3	TC WM SP	RGB	NA ZW 5-11-83
7	ET WM	GW	
14	EZ PB ET TC	RGB	

41. Laboratory Supervisor Signature: | 42. Date:

GA. 213

Type of Breaks: A = Cone, Mortar Failure B = Cone, Aggregate Failure C = Shear, Mortar Failure D = Shear, Aggregate Failure E = Other

7220-QCF-39 Rev. 5

UST-M-74@7 UST-M-130@14 UST-M-62@60

BECHTEL POWER CORPORATION
MIDLAND NUCLEAR POWER PLANT JOB 7220

REPORT OF CONCRETE CYLINDERS

1. Placement Identification: NA REF LETTER 10.6.21				2. Date Placed: 3-4-83	
3. Placement Location: ALLIED CONCRETE					
3A. PLANT DATA — Source: ALLIED CONCRETE			Cement Brand & Type: AETNA TYPE I		
4. Mix: #1	5. Class: I	6. "Q" List: ☒ Yes ☐ No	7. Required Strength: ~~4000~~ 400 PSI ET 3-5-83 At 28 Days		
8. Test Data At: BATCH PLANT (CM)	9. Unit Weight ASTM-C-138-74: 152.98 Lbs/Ft³		10. Yield: 26.73		
11. Moisture: Sand ASTM-C-566-67(72): 1.0 %	Stone 1: 0.6 %	Stone 2: NA %	12. Water/Cement & Pozzolan Ratio: 0.35 Max	0.35 Act.	
13. Ticket No.: 62964	14. Truck No.: 18	15. Time of Testing: 0918 Hrs at 2 Yards		16. Time of Molding: 0918 Hrs	
17. Slump ASTM-C-143-74: 3 Inches	18. Air Content ASTM-C-231-75: 1.7 %	19. Temp: Concrete: 64 °F	20. Temp: Air: 38 °F	21. Initials: (TC) AT, WM	
22. Initial Curing ASTM-C-31-69; Therm/Due Date: °F 50 To 71 °F; * 366 / 5-29-83		23. Stripped ASTM-C-31-69: 3-5-83 At 0755 Hrs		24. Initials: RG, LH, RB	

COMPRESSIVE STRENGTH DATA ASTM-C-39-71

25. Specimen Identification	26. Date Molded	27. Date Tested	28. Age	29. Total Load in Pounds	30. Actual Cyl Diam	31. Actual Cyl Area	32. Type of Break	33. Cure: Field	33. Cure: Lab	34. Strength PSI
SP1643-947	3-4-83	4-1-83	28	188,750	6.00	28.27	E	1	27	6680
948		4-1-83	28	189,500	5.94	27.71	A	1	27	6720
949		5-3-83	60	211,000	6 CC	28.27	A	1	54	7460
950		〃	〃	202,500	6 CC	28.27	A	1	54	7160
951		5-3-83	60	205,750	5.99	28.18	A	1	54	7300
952		6-2-83	90							
953		〃	〃							
SP1643-954	3-4-83	6-2-83	90							

35. Standard Cylinder: ☒ 6" x 12" ☐ Cube ☐ Core ☐ Other

40. Remarks: * INITIAL CURING OUT OF SPECIFICATION; JOHN GAYBOS, F.E., AND BOB WILSON, Q.C., NOTIFIED.

36. Age (Days)	37. Tested By	38. Checked By	39. Reviewed by Q.C.
28	WM KK	RH	NA 2DN 5-11-83
60	(RG) KK		

41. Laboratory Supervisor Signature: | 42. Date:

Type of Breaks: A = Cone, Mortar Failure B = Cone, Aggregate Failure C = Shear, Mortar Failure D = Shear, Aggregate Failure E = Other

GI .213

7220-QCF-39 Rev. 5

UST-M-1467 UST-M-130C14 UST-M-62@60

BECHTEL POWER CORPORATION
MIDLAND NUCLEAR POWER PLANT JOB 7220

REPORT OF CONCRETE CYLINDERS

1. Placement Identification: N/A REF LETTER 10621
2. Date Placed: 3-4-83
3. Placement Location: ALLIED CONCRETE
3A. PLANT DATA — Source: ALLIED CONCRETE; Cement Brand & Type: AETNA TYPE I
4. Mix: #2
5. Class: I
6. "Q" List: ☒ Yes ☐ No
7. Required Strength: ~~4000~~ 4000 PSI ET 3-5-83 At 28 Days
8. Test Data At: BATCH PLANT (CM)
9. Unit Weight ASTM-C-138-74: 153.89 Lbs/Ft³
10. Yield: 26.74
11. Moisture: Sand ASTM-C-566-67(72): 1.0 %; Stone 1: 0.6 %; Stone 2: N/A %
12. Water/Cement & Pozzolan Ratio: 0.37 Max 0.37 Act.
13. Ticket No.: 62965
14. Truck No.: 18
15. Time of Testing: 0949 Hrs at 2 Yards
16. Time of Molding: 0950 Hrs
17. Slump ASTM-C-143-74: 3 Inches
18. Air Content ASTM-C-231-75: 1.4 %
19. Temp: Concrete: 64 °F
20. Temp: Air: 37 °F
21. Initials: (TC) WM BT
22. Initial Curing ASTM-C-31-69; Therm/Due Date: 60°F To 80°F; LH / 9-24-83
23. Stripped ASTM-C-31-69: 3-5-83 At 0930 Hrs
24. Initials: TC QB, LH

COMPRESSIVE STRENGTH DATA ASTM-C-39-71

25. Specimen Identification	26. Date Molded	27. Date Tested	28. Age	29. Total Load in Pounds	30. Actual Cyl Diam	31. Actual Cyl Area	32. Type of Break	33. Cure: Field	33. Cure: Lab	34. Strength PSI
SP 1694 — 955	3-4-83	3-5-83	1	106,000	5.98	28.09	A	1	0	3,770
956	〃	〃	〃	110,000	6.00	28.27	A	1	0	3,890
957	〃	3-5-83	1	110,000	6.00	28.27	A	1	0	3,890
958	〃	3-6-83	2	120,250	6.01	28.37	A	1	1	4,240
959	〃	〃	〃	115,000	6.00	28.27	A	1	1	4070
960	〃	3-6-83	2	119,500	6.01	28.37	A	1	1	4210
961	〃	3-7-83	3	131,000	6.00	28.27	A	1	2	4,630
SP 1694 — 962	3-4-83	3-7-83	3	136,000	6.00	28.27	A	1	2	4,810

35. Standard Cylinder: ☒ 6" x 12" ☐ Cube ☐ Core ☐ Other
40. Remarks

36. Age (Days)	37. Tested By	38. Checked By	39. Reviewed by Q.C.
1	RTB LH	RH GT	N.A. 3-5-83
2	RH LH	RH GT	
3	WM SP	RH GT	

41. Laboratory Supervisor Signature
42. Date

Type of Breaks: A = Cone, Mortar Failure B = Cone, Aggregate Failure C = Shear, Mortar Failure D = Shear, Aggregate Failure E = Other

G/M 0213

7220-QCF-39 Rev. 5

ASTM-74 87 ASTM-130 C14 ASTM-620 60

BECHTEL POWER CORPORATION
MIDLAND NUCLEAR POWER PLANT JOB 7220

REPORT OF CONCRETE CYLINDERS

1. Placement Identification: N/A REF. LETTER 10621 | 2. Date Placed: 3-4-83

3. Placement Location: ALLIED CONCRETE

3A. PLANT DATA | Source: ALLIED CONCRETE | Cement Brand & Type: AETNA TYPE I

4. Mix: #2 | 5. Class: I | 6. "Q" List: ☑ Yes ☐ No | 7. Required Strength: ~~4000~~ PSI At 28 Days (EI 3-5-83)

8. Test Data At: BATCH PLANT (CM) | 9. Unit Weight ASTM-C-138-74: 153.89 Lbs/Ft³ | 10. Yield: 26.74

11. Moisture: Sand ASTM-C-566-67(72): 1.0 % | Stone 1: 0.6 % | Stone 2: N/A % | 12. Water/Cement & Pozzolan Ratio: 0.37 Max 0.37 Act.

13. Ticket No.: G2965 | 14. Truck No.: 18 | 15. Time of Testing: 0949 Hrs at 2 Yards | 16. Time of Molding: 0950 Hrs

17. Slump ASTM-C-143-74: 3 Inches | 18. Air Content ASTM-C-231-75: 1.4 % | 19. Temp: Concrete: 64 °F | 20. Temp: Air: 37 °F | 21. Initials: TC WM BT

22. Initial Curing ASTM-C-31-69; Therm/Due Date: 60 °F To 80 °F; 617 / 8-24-83 | 23. Stripped ASTM-C-31-69: 3-5-83 At 0930 Hrs | 24. Initials: RB LH TC

COMPRESSIVE STRENGTH DATA ASTM-C-39-71

25. Specimen Identification	26. Date Molded	27. Date Tested	28. Age	29. Total Load in Pounds	30. Actual Cyl Diam	31. Actual Cyl Area	32. Type of Break	33. Cure: Field	33. Cure: Lab	34. Strength PSI
SP1644-963	3-4-83	3-7-83	3	133,500	6.00	28.27	A	1	2	4,720
964		3-11-83	7	150,500	6.01	28.37	A	1	6	5300
965		〃	〃	155,500	6.00	28.27	C	1	6	5500
966		3-11-83	7	161,500	6.00	28.27	A	1	6	5710
967		3-18-83	14	166,500	5.99	28.18	A	1	13	5,910
968		〃	〃	174,000	6.00	28.27	A	1	13	6,150
969		3-18-83	14	168,250	6.00	28.27	B	1	13	5,950
SP1644-970	3-4-83	4-1-83	28	185,000	6.00	28.27	B	1	27	6,540

35. Standard Cylinder: ☑ 6" x 12" ☐ Cube ☐ Core ☐ Other

40. Remarks:

36. Age (Days)	37. Tested By	38. Checked By	39. Reviewed by Q.C.
3	WM SF	RLB 6/7	N.A. KW 5/18/83
7	ET, WM	GW 6/7	↓
14	RZ ET	RLB 6/7	↓

41. Laboratory Supervisor Signature: | 42. Date:

GA-213

Type of Breaks: A = Cone, Mortar Failure B = Cone, Aggregate Failure C = Shear, Mortar Failure D = Shear, Aggregate Failure E = Other

7220-QCF-39 Rev. 5

UST-M-74@7 UST-M-130@14 UST-M-62@28

BECHTEL POWER CORPORATION
MIDLAND NUCLEAR POWER PLANT JOB 7220

REPORT OF CONCRETE CYLINDERS

1. Placement Identification: N/A REF. LETTER 1066.21				2. Date Placed: 3-4-83	
3. Placement Location: ALLIED CONCRETE					
3A. PLANT DATA — Source: ALLIED CONCRETE			Cement Brand & Type: AETNA TYPE I		
4. Mix: #2	5. Class: I	6. "C" List: ☑ Yes ☐ No	7. Required Strength: 4000 PSI	At 28 Days	
8. Test Data At: BATCH PLANT (CM)	9. Unit Weight ASTM-C-138-74: 153.89 Lbs/Ft³		10. Yield: 26.74		
11. Moisture: Sand ASTM-C-566-67(72): 1.0 %	Stone 1: 6.6 %	Stone 2: N/A %	12. Water/Cement & Pozzolan Ratio: 0.37 Max	0.37 Act.	
13. Ticket No.: 62965	14. Truck No.: 18	15. Time of Testing: 0949 Hrs at 2 Yards	16. Time of Molding: 0950 Hrs		
17. Slump ASTM-C-143-74: 3 Inches	18. Air Content ASTM-C-231-75: 1.4 %	19. Temp: Concrete: 64 °F	20. Temp: Air: 37 °F	21. Initials: (TC) WM BT	
22. Initial Curing ASTM-C-31-69; Therm/Due Date: 60 °F To 80 °F; 617 / 8-24-83	23. Stripped ASTM-C-31-69: 3-5-83 At 0930 Hrs		24. Initials: RB LH TC		

COMPRESSIVE STRENGTH DATA ASTM-C-39-71

25. Specimen Identification	26. Date Molded	27. Date Tested	28. Age	29. Total Load in Pounds	30. Actual Cyl Diam	31. Actual Cyl Area	32. Type of Break	33. Cure: Field	33. Cure: Lab	34. Strength PSI
SP1699-971	3-4-83	4-1-83	28	182,500	6.00	28.27	A	1	27	6490
972	〃	4-1-83	28	175,250	6.00	28.27	E	1	27	6200
973	〃	5-3-83	60	203,750	6.00	28.27	A	1	59	7,210
974	〃	〃	〃	202,000	6.00	28.27	A	1	59	7,150
975	〃	5-3-83	60	214,000	6.00	28.27	A	1	59	7,570
976	〃	6-2-83	90							
977	〃	〃	〃							
SP1699-978	3-4-83	6-2-83	90							

35. Standard Cylinder: ☑ 6" x 12" ☐ Cube ☐ Core ☐ Other

40. Remarks

36. Age (Days)	37. Tested By	38. Checked By	39. Reviewed by Q.C.
28	WM, KK	RH	N/A 5-11-83
60	(RG) KK	RH	

41. Laboratory Supervisor Signature

42. Date

Type of Breaks: A = Cone, Mortar Failure B = Cone, Aggregate Failure C = Shear, Mortar Failure D = Shear, Aggregate Failure E = Other

7220-QCF-39 Rev. 5

GJ. 213

UST-M-7467 UST-M-130@14 UST-M-62@60

BECHTEL POWER CORPORATION
MIDLAND NUCLEAR POWER PLANT JOB 7220

REPORT OF CONCRETE CYLINDERS

1. Placement Identification: N/A REF. LETTER 10621 — 2. Date Placed: 3-4-83

3. Placement Location: ALLIED CONCRETE

3A. PLANT DATA — Source: ALLIED CONCRETE — Cement Brand & Type: AETNA TYPE I

4. Mix: #3 — 5. Class: I — 6. "Q" List: ☒ Yes ☐ No — 7. Required Strength: 4000 PSI At 28 Days

8. Test Data At: BATCH PLANT (CM) — 9. Unit Weight ASTM-C-138-74: 152.70 Lbs/Ft³ — 10. Yield: 26.94

11. Moisture: Sand ASTM-C-566-67(72): 1.0 % — Stone 1: 0.6 % — Stone 2: N/A % — 12. Water/Cement & Pozzolan Ratio: 0.368 Max 0.37 Act.

13. Ticket No.: 62966 — 14. Truck No.: 18 — 15. Time of Testing: 1017 Hrs at 2 Yards — 16. Time of Molding: 1018 Hrs

17. Slump ASTM-C-143-74: 3½ Inches — 18. Air Content ASTM-C-231-75: 1.6 % — 19. Temp: Concrete: 70 °F — 20. Temp: Air: 39 °F — 21. Initials: (TC) AT WM

22. Initial Curing ASTM-C-31-69; Therm/Due Date: 40 °F To 70 °F; CU 1 8-24-83 — 23. Stripped ASTM-C-31-69: 3-5-83 At 0910 Hrs — 24. Initials: JAW RTB 126, R.3 TC

COMPRESSIVE STRENGTH DATA ASTM-C-39-71

25. Specimen Identification	26. Date Molded	27. Date Tested	28. Age	29. Total Load in Pounds	30. Actual Cyl Diam	31. Actual Cyl Area	32. Type of Break	33. Cure: Field	33. Cure: Lab	34. Strength PSI
SP1645—979	3-4-83	3-5-83	1	103,500	5.98	28.09	A	1	0	3680
980	〃	〃	〃	102,000	5.99	28.18	A	1	0	3620
981		3-5-83	1	99,000	5.99	28.18	A	1	0	3510
982		3-6-83	2	116,000	5.99	28.18	A	1	1	4,120
983	〃	〃	〃	117,750	6.00	28.27	A	1	1	4170
984		3-6-83	2	115,500	6.00	28.27	A	1	1	4,090
985		3-7-83	3	126,000	6.00	28.27	A	1	2	4,460
SP1645—986	3-4-83	3-7-83	3	127000	6.00	28.27	A	1	2	4,490

35. Standard Cylinder: ☒ 6" x 12" ☐ Cube ☐ Core ☐ Other

40. Remarks

36. Age (Days)	37. Tested By	38. Checked By	39. Reviewed by Q.C.
1	LH, RTB	RH	NA RTB 5-4-83
2	LH RH	RH	
3	WM TC	RH	

41. Laboratory Supervisor Signature — 42. Date

Type of Breaks: A = Cone, Mortar Failure B = Cone, Aggregate Failure C = Shear, Mortar Failure D = Shear, Aggregate Failure E = Other

G 213

7220-QCF-39 Rev. 5

UST-M-74 @ 7 UST-M-130 @ 14 UST-M-62 @ 60

BECHTEL POWER CORPORATION
MIDLAND NUCLEAR POWER PLANT JOB 7220

REPORT OF CONCRETE CYLINDERS

1. Placement Identification: Air REF LETTER 10662				2. Date Placed: 3-4-83
3. Placement Location: ALLIED CONCRETE				
3A. PLANT DATA — Source: ALLIED CONCRETE			Cement Brand & Type: ASTM TYPE I	
4. Mix: #3	5. Class: I	6. "Q" List: ☒ Yes ☐ No	7. Required Strength: 4100 PSI At 28 Days	
8. Test Data At: BATCH PLANT (C.M.)	9. Unit Weight ASTM-C-138-74: 152.20 Lbs/Ft³		10. Yield: 26.94	
11. Moisture: Sand ASTM-C-566-67(72): 1.6 %	Stone 1: 0.6 %	Stone 2: N/A %	12. Water/Cement & Pozzolan Ratio: 0.368 Max 0.37 Act.	
13. Ticket No.: 62966	14. Truck No.: 18	15. Time of Testing: 1017 Hrs at 2 Yards	16. Time of Molding: 1014 Hrs	
17. Slump ASTM-C-143-74: 3½ Inches	18. Air Content ASTM-C-231-75: 1.6 %	19. Temp: Concrete: 70 °F	20. Temp: Air: 39 °F	21. Initials: (TC) BT WM
22. Initial Curing ASTM-C-31-69; Therm/Dup Date: 40 °F To 40 °F; CT7 / 6-24-83		23. Stripped ASTM-C-31-69: 3-5-83 At 0910 Hrs	24. Initials: PG RT JEW	

COMPRESSIVE STRENGTH DATA ASTM-C-39-71

25. Specimen Identification	26. Date Molded	27. Date Tested	28. Age	29. Total Load in Pounds	30. Actual Cyl Diam	31. Actual Cyl Area	32. Type of Break	33. Cure Field	33. Cure Lab	34. Strength PSI
SPECS— 987	3-4-83	3-7-83	3	130,500	5.99	28.18	A	1	2	4630
988		3-11-83	7	~~153,000~~ 146,750	5.99	28.18	~~A~~ A	1	6	~~5430~~ 5210
989		"	"	~~146,500~~ 144,500	~~5.97~~ 5.99	~~28.12~~ 28.27	A	1	6	~~5200~~ 5110
990		3-11-83	7	~~146,750~~ 144,500	5.99	~~28.18~~ 28.27	A	1	6	~~5210~~ 5110
991		3-18-83	14	168,500	5.98	28.09	A	1	13	6,000
992		"	"	165,500	~~5.98~~ 5.97	28.09	A	1	13	5,890
993		3-18-83	14	173,000	5.99	28.18	A	1	13	6,140
SPECS— 994	3-4-83	4-1-83	28	M7,500	6.00	28.27	A	1	27	6630

35. Standard Cylinder: ☑ 6" x 12" ☐ Cube ☐ Core ☐ Other

40. Remarks

36. Age (Days)	37. Tested By	38. Checked By	39. Reviewed by Q.C.
3	WM TC	RJB	NA RDW 5.1.83
7	BW ET WM GW	RJB	
14	ET RZ	RJB	

41. Laboratory Supervisor Signature

42. Date

Type of Breaks: A = Cone, Mortar Failure B = Cone, Aggregate Failure C = Shear, Mortar Failure D = Shear, Aggregate Failure E = Other

7230-QCF-39 Rev. 5

UST-M-1Y@7 UST-M-130@14 UST-M-62@28

BECHTEL POWER CORPORATION
MIDLAND NUCLEAR POWER PLANT JOB 7220

REPORT OF CONCRETE CYLINDERS

1. Placement Identification: N/A REF. LETTER 10621												2. Date Placed: 3-4-83		
3. Placement Location: ALLied CONCRETE														
3A. PLANT DATA	Source: ALLIED CONCRETE									Cement Brand & Type: AETNA TYPE I				
4. Mix: # 3	5. Class: I		6. "Q" List: ☒ Yes ☐ No		7. Required Strength: 4000 PSI At 28 Days									
8. Test Data At: BATCH PLANT (CAT)			9. Unit Weight ASTM-C-138-74: 152.30 Lbs/Ft³							10. Yield: 26.94				
11. Moisture: Sand ASTM-C-566-67(72): 1.0 %			Stone 1: 0.6 %			Stone 2: N/A %				12. Water/Cement & Pozzolan Ratio: 0.368 Max 0.37 Act.				
13. Ticket No.: 62961			14. Truck No.: 14			15. Time of Testing: 1017 Hrs at 3 Yards				16. Time of Molding: 1014 Hrs				
17. Slump ASTM-C-143-74: 3½ Inches			18. Air Content ASTM-C-231-75: 1.6 %			19. Temp: Concrete: 70 °F				20. Temp: Air: 39 °F			21. Initials: (TC) RT WM	
22. Initial Curing ASTM-C-31-69; Therm/Due Date: 60°F To 90°F; A17 14-JAN-83			23. Stripped ASTM-C-31-69: 3-4-83 At 0911 Hrs										24. Initials: RG, JEW TC, RG, RTG	
COMPRESSIVE STRENGTH DATA ASTM-C-39-71														
25. Specimen Identification	26. Date Molded	27. Date Tested	28. Age	29. Total Load in Pounds	30. Actual Cyl Diam	31. Actual Cyl Area	32. Type of Break	33. Cure: Field	Cure: Lab	34. Strength PSI				
SP1695- 995	3-4-83	4-1-83	28	182,350	6.00	28.27	C	1	27	6450				
996		4-1-83	28	188,500	6.00	28.27	C	1	27	6670				
997		5-3-83	60	204,000	6.00	28.27	A	1	59	7,220				
998		〃	〃	208,750	5.99	28.18	A	1	59	7,410				
999		5-3-83	60	186,000	5.99	28.18	A	1	59	6,600				
1000		6-2-83	90											
1001		〃	〃											
SP1695- 1002	3-4-83	6-2-83	90											

35. Standard Cylinder: ☒ 6" x 12" ☐ Cube ☐ Core ☐ Other

40. Remarks

36. Age (Days)	37. Tested By	38. Checked By	39. Reviewed by Q.C.
28	WM KK	RH	N.A. 2DW 4-11-83
60 (RG)	KK	RH	✓
			✓

41. Laboratory Supervisor Signature

42. Date

Type of Breaks: A = Cone, Mortar Failure B = Cone, Aggregate Failure C = Shear, Mortar Failure D = Shear, Aggregate Failure E = Other

7220-QCF-39 Rev. 5

UST-M-74@7 UST-M-130@14 UST-M-62@60

BECHTEL POWER CORPORATION
MIDLAND NUCLEAR POWER PLANT JOB 7220

REPORT OF CONCRETE CYLINDERS

1. Placement Identification: N/A REF. LETTER 10662 1 — 2. Date Placed: 3-4-83

3. Placement Location: ALLIED CONCRETE

3A. PLANT DATA — Source: ALLIED CONCRETE — Cement Brand & Type: AETNA TYPE I

4. Mix: #4 — 5. Class: I — 6. "Q" List: ☑ Yes ☐ No — 7. Required Strength: 4000 PSI At 28 Days

8. Test Data At: BATCH PLANT (CM) — 9. Unit Weight ASTM-C-138-74: 150.96 Lbs/Ft³ — 10. Yield: 26.92

11. Moisture: Sand ASTM-C-566-67(72): 1.0 % — Stone 1: 0.6 % — Stone 2: N/A % — 12. Water/Cement & Pozzolan Ratio: 0.393 Max 0.38 Act.

13. Ticket No.: 62967 — 14. Truck No.: 18 — 15. Time of Testing: 1043 Hrs at 2 Yards — 16. Time of Molding: 1044 Hrs

17. Slump ASTM-C-143-74: 3 1/2 Inches — 18. Air Content ASTM-C-231-75: 1.7 % — 19. Temp: Concrete: 68 °F — 20. Temp: Air: 38 °F — 21. Initials: (TC) ET WM

22. Initial Curing ASTM-C-31-69; Therm/Due Date: 60 °F To 90 °F; 6.17 / 8-24-83 — 23. Stripped ASTM-C-31-69: ~~1022~~ 3-5-83 At 1023 Hrs — 24. Initials: RB, TC

3-5-83 (2)

COMPRESSIVE STRENGTH DATA ASTM-C-39-71

25. Specimen Identification	26. Date Molded	27. Date Tested	28. Age	29. Total Load in Pounds	30. Actual Cyl Diam	31. Actual Cyl Area	32. Type of Break	33. Cure: Field	33. Cure: Lab	34. Strength PSI
SP1646-1003	3-4-83	3-5-83	1	90,500	6.00	28.27	A	1	0	3,200
1004				93,500	6.00	28.27	A	1	0	3,310
1005		3-5-83	1	100,000	6.00	28.27	C	1	0	3,540
1006		3-6-83	2	113,500	5.98	28.09	A	1	1	4040
1007				109,500	5.98	28.09	A	1	1	3900
1008		3-6-83	2	118,000	6.00	28.27	A	1	1	4,170
1009		3-7-83	3	118,000	6.00	28.27	A	1	2	4,170
SP1646-1010	3-4-83	3-7-83	3	127,000	6.01	28.37	A	1	2	4480

35. Standard Cylinder: ☑ 6" x 12" ☐ Cube ☐ Core ☐ Other

40. Remarks:

36. Age (Days)	37. Tested By	38. Checked By	39. Reviewed by Q.C.
1	RTB LH	RH	N.A. RBW 5 11 83
2	LH RH	RLB	
3	WM SFFB	RLB	

41. Laboratory Supervisor Signature: — 42. Date:

Type of Breaks: A = Cone, Mortar Failure B = Cone, Aggregate Failure C = Shear, Mortar Failure D = Shear, Aggregate Failure E = Other

7220-QCF-39 Rev. 5

UST-A-74 C 7 UST-A-130 C 14 UST-A-62 C. 60

BECHTEL POWER CORPORATION
MIDLAND NUCLEAR POWER PLANT JOB 7220

REPORT OF CONCRETE CYLINDERS

1. Placement Identification: N/A REF. LETTER 10662 | 2. Date Placed: 3-4-83

3. Placement Location: ALLIED CONCRETE

3A. PLANT DATA — Source: ALLIED CONCRETE | Cement Brand & Type: AETNA TYPE I

4. Mix: #4 | 5. Class: I | 6. "Q" List: ☒ Yes ☐ No | 7. Required Strength: 4000 PSI At 28 Days

8. Test Data At: BATCH PLANT (CM) | 9. Unit Weight ASTM-C-138-74: 152.96 Lbs/Ft³ | 10. Yield: 26.92

11. Moisture: Sand ASTM-C-566-67(72): 1.0 % | Stone 1: 0.6 % | Stone 2: N/A % | 12. Water/Cement & Pozzolan Ratio: 0.393 Max 0.38 Act.

13. Ticket No.: 62967 | 14. Truck No.: 18 | 15. Time of Testing: 1043 Hrs at 2 Yards | 16. Time of Molding: 1044 Hrs

17. Slump ASTM-C-143-74: 3½ Inches | 18. Air Content ASTM-C-231-75: 1.7 % | 19. Temp: Concrete: 68 °F | 20. Temp: Air: 38 °F | 21. Initials: (TC) ET WM

22. Initial Curing ASTM-C-31-69; Therm/Due Date: 60 °F To 80 °F; 617 / 9-24-83 | 23. Stripped ASTM-C-31-69: 3-5-83 At 1023 Hrs | 24. Initials: RP TC

COMPRESSIVE STRENGTH DATA ASTM-C-39-71

25. Specimen Identification	26. Date Molded	27. Date Tested	28. Age	29. Total Load in Pounds	30. Actual Cyl Diam	31. Actual Cyl Area	32. Type of Break	33. Cure: Field	33. Cure: Lab	34. Strength PSI
SP1646 1011	3-4-83	3-7-83	3	116,500	6.01	28.37	A	1	2	4,110
1012	"	3-11-83	7	143,000	6.00	28.27	A	1	6	5060
1013	"	"	"	150,000	6.00	28.27	A	1	6	5310
1014	"	3-11-83	7	145,750	6.00	28.27	A	1	6	5160
1015	"	3-18-83	14	162,250	5.99	28.18	A	1	13	5,760
1016	"	"	"	168,000	6.00	28.27	B	1	13	5,940
1017	"	3-18-83	14	166,250	6.00	28.27	A	1	13	5,880
SP1646 1018	3-4-83	4-1-83	28	176,750	5.99	28.18	A	1	27	6270

35. Standard Cylinder: ☒ 6" x 12" ☐ Cube ☐ Core ☐ Other

40. Remarks

36. Age (Days)	37. Tested By	38. Checked By	39. Reviewed by Q.C.
3	WM SF PB	RLG	N.A. RW 5/11/83
7	ET, WM	GW	
14	ET RZ PB TC	RLG	

41. Laboratory Supervisor Signature | 42. Date

Type of Breaks: A = Cone, Mortar Failure B = Cone, Aggregate Failure C = Shear, Mortar Failure D = Shear, Aggregate Failure E = Other

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UST-M-74@7 UST-M-130@14 UST-M-62@60

BECHTEL POWER CORPORATION
MIDLAND NUCLEAR POWER PLANT JOB 7220

REPORT OF CONCRETE CYLINDERS

1. Placement Identification: N/A REF. LETTER 10621				2. Date Placed: 3-4-83	
3. Placement Location: ALLIED CONCRETE					
3A. PLANT DATA — Source: ALLIED CONCRETE			Cement Brand & Type: AETNA TYPE I		
4. Mix: #4	5. Class: I	6. "Q" List: ☒ Yes ☐ No	7. Required Strength: 4000 PSI	At: 28 Days	
8. Test Data At: BATCH PLANT (CM)	9. Unit Weight ASTM-C-138-74: 152.96 Lbs/Ft³		10. Yield: 26.92		
11. Moisture: Sand ASTM-C-566-67(72): 1.0 %	Stone 1: 0.6 %	Stone 2: N/A %	12. Water/Cement & Pozzolan Ratio: 0.39 Max	0.38 Act.	
13. Ticket No.: 62967	14. Truck No.: 18	15. Time of Testing: 1043 Hrs at 2 Yards		16. Time of Molding: 1044 Hrs	
17. Slump ASTM-C-143-74: 3½ Inches	18. Air Content ASTM-C-231-75: 1.7 %	19. Temp: Concrete: 68 °F	20. Temp: Air: 38 °F	21. Initials: (TC) BT WM	
22. Initial Curing ASTM-C-31-69: 60 °F To 80 °F; Therm/Due Date: 617 / 8-24-83		23. Stripped ASTM-C-31-69: 3-5-83 At 1023 Hrs		24. Initials: RB TC	

COMPRESSIVE STRENGTH DATA ASTM-C-39-71

25. Specimen Identification	26. Date Molded	27. Date Tested	28. Age	29. Total Load in Pounds	30. Actual Cyl Diam	31. Actual Cyl Area	32. Type of Break	33. Cure: Field	33. Cure: Lab	34. Strength PSI
SPIKE 1019	3-4-83	4-1-83	28	173,500	6.01	28.37	A	1	27	6120
1020		4-1-83	28	~~173,500~~ 175,500	6.00	28.27	A	1	27	6210
1021		5-3-83	60	193,500	6.00	28.27	A	1	59	6,840
1022		〃	〃	193,500	6.00	28.27	A	1	59	6,840
1023		5-3-83	60	196,500	6.00	28.27	A	1	59	6,950
1024		6-2-83	90							
1025		〃	〃							
SPIKE 1026	3-4-83	6-2-83	90							

35. Standard Cylinder: ☒ 6" x 12" ☐ Cube ☐ Core ☐ Other

40. Remarks:

36. Age (Days)	37. Tested By	38. Checked By	39. Reviewed by Q.C.
28	WM KK	R.H.	N.A. JDN 5-11-83
60	RG	RB	

41. Laboratory Supervisor Signature:

42. Date:

Type of Breaks: A = Cone, Mortar Failure B = Cone, Aggregate Failure C = Shear, Mortar Failure D = Shear, Aggregate Failure E = Other

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ASTM-C-39 ASTM-C-138 ASTM-C-143 ASTM-C-231 ASTM-C-31 ASTM-C-172

BECHTEL POWER CORPORATION
MIDLAND NUCLEAR POWER PLANT JOB 7220

REPORT OF CONCRETE CYLINDERS

1. Placement Identification: N/A REF. LETTER 10662.1
2. Date Placed: 3-4-83
3. Placement Location: ALLIED CONCRETE
3A. PLANT DATA — Source: ALLIED CONCRETE — Cement Brand & Type: AETNA TYPE I
4. Mix: #5
5. Class: I
6. "Q" List: ☑ Yes ☐ No
7. Required Strength: 4000 PSI At 28 Days
8. Test Data At: BATCH PLANT (CM)
9. Unit Weight ASTM-C-138-74: 152.84 Lbs/Ft³
10. Yield: 26.62
11. Moisture: Sand ASTM-C-566-67(72): 1.0 % — Stone 1: 0.6 % — Stone 2: N/A %
12. Water/Cement & Pozzolan Ratio: 0.412 Max — 0.38 Act.
13. Ticket No.: 62968
14. Truck No.: 18
15. Time of Testing: 1106 Hrs at 2 Yards
16. Time of Molding: 1107 Hrs
17. Slump ASTM-C-143-74: 3 1/2 Inches
18. Air Content ASTM-C-231-75: 1.9 %
19. Temp: Concrete: 71 °F
20. Temp: Air: 42 °F
21. Initials: (FC) BT WM
22. Initial Curing ASTM-C-31-69; Therm/Due Date: 60 °F To 80 °F; 617 / 8-24-83
23. Stripped ASTM-C-31-69: 3-5-83 At 1000 Hrs
24. Initials: RA TT, RL LH

COMPRESSIVE STRENGTH DATA ASTM-C-39-71

25. Specimen Identification	26. Date Molded	27. Date Tested	28. Age	29. Total Load in Pounds	30. Actual Cyl Diam	31. Actual Cyl Area	32. Type of Break	33. Cure Field	33. Cure Lab	34. Strength PSI
SP1647- 1027	3-4-83	3-5-83	1	91,000	6.01	28.37	A	1	0	3,210
1028	〃	〃	〃	89,750	6.00	28.27	A	1	0	3,170
1029	〃	3-5-83	1	86,500	6.00	28.27	B	1	0	3,060
1030	〃	3-6-83	2	105,000	6.00	28.27	A	1	1	3,710
1031	〃	〃	〃	107,500	5.99	28.18	A	1	1	3,810
1032	〃	3-6-83	2	104,500	6.00	28.27	A	1	1	3,700
1033	〃	3-7-83	3	120,500	6.00	28.27	A	1	2	4,260
SP1647- 1034	3-4-83	3-7-83	3	116,000	6.01	28.37	A	1	2	4,090

35. Standard Cylinder: ☑ 6" x 12" ☐ Cube ☐ Core ☐ Other
40. Remarks

36. Age (Days)	37. Tested By	38. Checked By	39. Reviewed by Q.C.
1	RTB, LH	RH	N.A. 3/4/83
2	RH LH	RH	
3	WP, SF, TC	RH	

41. Laboratory Supervisor Signature
42. Date

Type of Breaks: A = Cone, Mortar Failure B = Cone, Aggregate Failure C = Shear, Mortar Failure D = Shear, Aggregate Failure E = Other

7220-QCF-39 Rev. 5

UST-M-74@7 UST-M-130@14 UST-M-62@60

BECHTEL POWER CORPORATION
MIDLAND NUCLEAR POWER PLANT JOB 7220

REPORT OF CONCRETE CYLINDERS

1. Placement Identification: N/A REF. LETTER 10621				2. Date Placed: 3-4-83	
3. Placement Location: ALLIED CONCRETE					
4. PLANT DATA — Source: ALLIED CONCRETE			Cement Brand & Type: AETNA TYPE I		
4. Mix: #5	5. Class: I	6. "Q" List: ☒ Yes ☐ No	7. Required Strength: 4000 PSI	At: 28 Days	
8. Test Data At: BATCH PLANT (CM)	9. Unit Weight ASTM-C-138-74: 152.84 Lbs/Ft³		10. Yield: 26.62		
11. Moisture: Sand ASTM-C-566-67(72): 1.0 %	Stone 1: 0.6 %	Stone 2: N/A %	12. Water/Cement & Pozzolan Ratio: 0.412 Max	0.38 Act.	
13. Ticket No.: 62968	14. Truck No.: 18	15. Time of Testing: 1106 Hrs at 2 Yards		16. Time of Molding: 1107 Hrs	
17. Slump ASTM-C-143-74: 3½ Inches	18. Air Content ASTM-C-231-75: 1.9 %	19. Temp: Concrete: 71 °F	20. Temp: Air: 42 °F	21. Initials: (TC) AT WM	
22. Initial Curing ASTM-C-31-69; Therm/Due Date: 60 °F To 80 °F; 617 18-24-83		23. Stripped ASTM-C-31-69: 3-5-83 At 1000 Hrs		24. Initials: RB TC PC LH	

COMPRESSIVE STRENGTH DATA ASTM-C-39-71

25. Specimen Identification	26. Date Molded	27. Date Tested	28. Age	29. Total Load in Pounds	30. Actual Cyl Diam	31. Actual Cyl Area	32. Type of Break	33. Cure: Field	33. Cure: Lab	34. Strength PSI
SPK47 — 1043	3-4-83	4-1-83	28	162,500	6.01	28.37	A	1	27	5740
1044		4-1-83	28	177,500	6.00	28.27	A	1	27	6280
1045		5-3-83	60	200,000	6.00	28.27	A	1	59	7070
1046		〃	〃	199,000	6.00	28.27	B	1	59	7040
1047		5-3-83	60	200,500	6.00	28.27	A	1	59	7090
1048		6-2-83	90							
1049		〃	〃							
SPK47 — 1050	3-4-83	6-2-83	90							

35. Standard Cylinder: ☒ 6" x 12" ☐ Cube ☐ Core ☐ Other

40. Remarks:

36. Age (Days)	37. Tested By	38. Checked By	39. Reviewed by Q.C.	41. Laboratory Supervisor Signature	42. Date
28	WM, KK	RH	NA 5/11/83		
60	RE, KK/KD	RH			

Type of Breaks: A = Cone, Mortar Failure B = Cone, Aggregate Failure C = Shear, Mortar Failure D = Shear, Aggregate Failure E = Other

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QA 213

UST-M-74@7 UST-M-130@14 UST-M-62@60

BECHTEL POWER CORPORATION
MIDLAND NUCLEAR POWER PLANT JOB 7220

REPORT OF CONCRETE CYLINDERS

1. Placement Identification: N/A REF. LETTER 1066.21
2. Date Placed: 3-4-83
3. Placement Location: ALLIED CONCRETE
3A. PLANT DATA — Source: ALLIED CONCRETE — Cement Brand & Type: AETNA TYPE I
4. Mix: # 5
5. Class: I
6. "Q" List: ☒ Yes ☐ No
7. Required Strength: 4000 PSI At 28 Days
8. Test Data At: Batch PLANT (CM)
9. Unit Weight ASTM-C-138-74: 152.84 Lbs/Ft³
10. Yield: 26.62
11. Moisture: Sand ASTM-C-566-67(72): 1.0 % — Stone 1: 0.6 % — Stone 2: N/A %
12. Water/Cement & Pozzolan Ratio: 0.442 Max — 0.38 Act.
13. Ticket No.: 62918
14. Truck No.: 18
15. Time of Testing: 1106 Hrs at 2 Yards
16. Time of Molding: 1107 Hrs
17. Slump ASTM-C-143-74: 3 1/2 Inches
18. Air Content ASTM-C-231-75: 1.9 %
19. Temp: Concrete: 71 °F
20. Temp: Air: 42 °F
21. Initials: EG, ET, WM
22. Initial Curing ASTM-C-31-69; Therm/Due Date: 60°F To 80°F; A17 18-2483
23. Stripped ASTM-C-31-69: 3-5-83 At 1000 Hrs
24. Initials: EG, TC, EG, LH

COMPRESSIVE STRENGTH DATA ASTM-C-39-71

25. Specimen Identification	26. Date Molded	27. Date Tested	28. Age	29. Total Load in Pounds	30. Actual Cyl Diam	31. Actual Cyl Area	32. Type of Break	33. Cure: Field	33. Cure: Lab	34. Strength PSI
SP1647-1035	3-4-83	3-7-83	3	119,500	6.00	28.27	A	1	2	4,230
1036		3-11-83	7	147,500	5.99	28.18	A	1	6	5230
1037		〃	〃	146,000	6.00	28.27	A	1	6	5160
1038		3-11-83	7	150,000	6.00	28.27	A	1	6	5310
1039		3-18-83	14	164,500	5.99	28.18	A	1	13	5,840
1040		〃	〃	161,000	5.99	28.18	A	1	13	5,710
1041		3-18-83	14	164,250	5.99	28.18	A	1	13	5,830
SP1647-1042	3-4-83	4-1-83	28	180,500	6.00	28.27	A	1	27	6390

35. Standard Cylinder: ☒ 6" x 12" ☐ Cube ☐ Core ☐ Other
40. Remarks

36. Age (Days)	37. Tested By	38. Checked By	39. Reviewed by Q.C.
3	WM, SF, TC	[illegible]	N.A.
7	ET, WM	[illegible]	
14	RZ ET	[illegible]	

41. Laboratory Supervisor Signature
42. Date

Type of Breaks: A = Cone, Mortar Failure B = Cone, Aggregate Failure C = Shear, Mortar Failure D = Shear, Aggregate Failure E = Other

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UST-19-77@7 UST-M-130@14 UST-M-62@28

Attachment - B

Mix Proportions E 5 C-H 6000 psi @ 60 days
C 6C-H with HRWR.

Check Mixes for slump requirement

Batch ticket	Mix	W/c ratio	slump initial inches	slump with HRWR inches	Strength 28 days	Strength 60 days
62979	1B		3 1/4	9 1/4		
62980	2B	0.362	3 1/2	8 1/2 J	6650	7293
62981	3B	0.365	2 3/4	8 J	6520	7333
62983	4B		2 1/2	7		
62984	5B	0.411	3	7 1/2 J	5920	6723

Max slump to be 8" with HRWR
range = 7 1/4 to 8 3/4
Only 2B, 3B, and 5B are acceptable

Results of w/c ratio against strength are plotted

E-5C-1
C-6C-H

BECHTEL POWER CORPORATION
MIDLAND NUCLEAR POWER PLANT JOB 7220

REPORT OF CONCRETE CYLINDERS

1. Placement Identification: Trial Mix				2. Date Placed: 3-5-83	
3. Placement Location: U.S. Testing					
3A. PLANT DATA Source: Allied Concrete Prod			Cement Brand & Type: Ideal Type I		
4. Mix: 2B	5. Class: I	6. "Q" List: ☑ Yes ☐ No	7. Required Strength: 4000 PSI	At: 28 Days	
8. Test Data At: Lab	9. Unit Weight ASTM-C-138-74: 153.03 Lbs/Ft³		CA-TO Division: 26.91		
11. Moisture: Sand ASTM-C-566-67(72): 1.9 %	Stone 1: 0.5 %	Stone 2: LA %	12. Water/Cement & Pozzolan Ratio: .37 Max	.36 Act.	
13. Ticket No.: 62920	14. Truck No.: 18	15. Time of Testing: 0940 Hrs at 2 Yards		16. Time of Molding: 0240 Hrs	
17. Slump ASTM-C-143-74: 9 1/2 Inches	18. Air Content ASTM-C-231-75: 1.3 %	19. Temp: Concrete: 64 °F	20. Temp: Air: 40 °F	21. Initials: BT, LH, DS	
22. Initial Curing ASTM-C-31-69; Therm/Due Date: 68 °F To 74 °F; C20 / 5-24-83		23. Stripped ASTM-C-31-69: 3-6-83 At 0300 Hrs		24. Initials: JW, ST, RC	

COMPRESSIVE STRENGTH DATA ASTM-C-39-71

25. Specimen Identification	26. Date Molded	27. Date Tested	28. Age	29. Total Load in Pounds	30. Actual Cyl Diam	31. Actual Cyl Area	32. Type of Break	33. Cure: Field	Lab	34. Strength PSI
SP 1654 1195	3-5-83	3-6-83	1	100,500	5.99	28.18	A	1	0	3,570
1196		)	1	100,000	6.00	28.27	A	1	0	3,540
1197		3-6-83	1	102,500	5.99	28.18	A	1	0	3,640
1198		3-7-83	2	124,000	6.00	28.27	A	1	1	4,390
1199		)	2	122,500	5.99	28.18	A	1	1	4,350
1200		3-7-83	2	119,750	6.00	28.27	A	1	1	4,240
1201		3-8-83	3	132,500	5.99	28.18	A	1	2	4,700
SP 1654 1202	3-5-83	3-8-83	3	128,250	6.00	28.27	A	1	2	4,540

35. Standard Cylinder: ☑ 6" x 12" ☐ Cube ☐ Core ☐ Other

40. Remarks: INSUFFICIENT CURING TEMP OUT OF SPEC TEMPERATURE TOO LOW. P.O. Q.C.

36. Age (Days)	37. Tested By	38. Checked By	39. Reviewed by Q.C.	
1	LH RW	RJA GT	N.A. 4-15-83	NOTIFIED, 4-15-83 @ 1457
2	WM TC	RJA GT		TEMP 74° @ 1532 4-15-83
3	WM LH	RJA GT		

41. Laboratory Supervisor Signature: 42. Date

Type of Breaks: A = Cone, Mortar Failure B = Cone, Aggregate Failure C = Shear, Mortar Failure D = Shear, Aggregate Failure E = Other

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UST-M-76 @ 7 UST-M-131 @ 14 UST-M-80 @ 28 @

BECHTEL POWER CORPORATION
MIDLAND NUCLEAR POWER PLANT JOB 7220

REPORT OF CONCRETE CYLINDERS

1. Placement Identification: Trial Mix				2. Date Placed: 3-5-83	
3. Placement Location: U.S. Testing					
3A. PLANT DATA — Source: Allied Concrete Prod			Cement Brand & Type: Atlas Type I		
4. Mix: 28	5. Class: I	6. "Q" Last: ☑ Yes ☐ No	7. Required Strength: 4000 PSI	At: 28 Days	
8. Test Data At: Lab	9. Unit Weight ASTM-C-138-74: 153.03 Lbs/Ft³		10. Yield: 26.91		
11. Moisture: Sand ASTM-C-566-67(72): 1.9 %	Stone 1: 0.5 %	Stone 2: NA %	12. Water/Cement & Pozzolan Ratio: .37 Max	.36 Act.	
13. Ticket No.: 62987	14. Truck No.: 18	15. Time of Testing: 0940 Hrs at 2 Yards	16. Time of Molding: 0940 Hrs		
17. Slump ASTM-C-143-74: 8½ Inches	18. Air Content ASTM-C-231-75: 1.3 %	19. Temp: Concrete: 64 °F	20. Temp: Air: 40 °F	21. Initials: BT, CH, DS	
22. Initial Curing ASTM-C-31-69; Therm/Due Date: 68 °F To 74 °F; C20 / 3-24-83		23. Stripped ASTM-C-31-69: 3-6-83 At 0350 Hrs		24. Initials: JW, SJ, RC	

COMPRESSIVE STRENGTH DATA ASTM-C-39-71

25. Specimen Identification	26. Date Molded	27. Date Tested	28. Age	29. Total Load in Pounds	30. Actual Cyl Diam	31. Actual Cyl Area	32. Type of Break	33. Cure: Field	33. Cure: Lab	34. Strength PSI
SJ 1654 1203	3-5-83	3-8-83	3	128,500	6.00	28.27	A	1	2	4,550
1204		3-12-83	7	152500	6.01	28.37	A	1	6	5380
1205		"	7	152250	6.01	28.37	A	1	6	5370
1206		3-12-83	7	152000	6.01	28.37	A	1	6	5360
1207		3-19-83	14	165,500	6.01	28.37	A	1	13	5,830
1208		"	14	170,000	5.98	28.09	B	1	13	6,050
1209		3-19-83	14	167,000	5.98	28.09	B	1	13	5,950
SJ 1654 1210	3-5-83	4-2-83	28	190,250	5.99	28.18	A	1	27	6750

35. Standard Cylinder: ☑ 6" x 12" ☐ Cube ☐ Core ☐ Other

40. Remarks

36. Age (Days)	37. Tested By	38. Checked By	39. Reviewed by Q.C.
3	WALH	RAG GT	N.A. RW 5/18/83
7	TI JL	GW GT	
14	RTG PBT	DD GT	

41. Laboratory Supervisor Signature

42. Date

Type of Breaks: A = Cone, Mortar Failure B = Cone, Aggregate Failure C = Shear, Mortar Failure D = Shear, Aggregate Failure E = Other

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G/M 0213

UST-M-76@7 UST-M-131@14 UST-mo-58@60

BECHTEL POWER CORPORATION
MIDLAND NUCLEAR POWER PLANT JOB 7220

REPORT OF CONCRETE CYLINDERS

1. Placement Identification: Trial Mix
2. Date Placed: 3-5-83
3. Placement Location: U.S. Testing
3A. PLANT DATA — Source: Allied Concrete Prod — Cement Brand & Type: Active Type I
4. Mix: 2B
5. Class: I
6. "Q" List: ☑ Yes ☐ No
7. Required Strength: ~~4000~~ 3000 PSI At 28 Days
8. Test Data At: Lab
9. Unit Weight ASTM-C-138-74: 153.03 Lbs/Ft³
10. Yield: 26.91
11. Moisture: Sand ASTM-C-566-67(72): 1.9 % — Stone 1: 0.5 % — Stone 2: NA %
12. Water/Cement & Pozzolan Ratio: .37 Max .36 Act.
13. Ticket No.: 627807
14. Truck No.: 18
15. Time of Testing: 0940 Hrs at 2 Yards
16. Time of Molding: 0940 Hrs
17. Slump ASTM-C-143-74: 8½ Inches
18. Air Content ASTM-C-231-75: 1.3 %
19. Temp: Concrete: 64 °F
20. Temp: Air: 40 °F
21. Initials: PT, LH, DS
22. Initial Curing ASTM-C-31-69; Therm. Due Date: 60°F To 74°F; CTC 12-24-83
23. Stripped ASTM-C-31-69: 3-4-83 At 0300 Hrs
24. Initials: JOW, RC, SJ

COMPRESSIVE STRENGTH DATA ASTM-C-39-71

25. Specimen Identification	26. Date Molded	27. Date Tested	28. Age	29. Total Load in Pounds	30. Actual Cyl Diam	31. Actual Cyl Area	32. Type of Break	33. Cure: Field	33. Cure: Lab	34. Strength PSI
11:54 1211	3-5-83	4-2-83	28	188,500	5.99	28.18	A	1	27	6690
1212		4-2-83	28	183,500	5.99	28.18	A	1	27	6510
1213		5-4-83	60	209,000	6.00	28.27	B	1	59	7,390
1214			60	206,000	5.99	28.18	B	1	59	7,310
1215		5-4-83	60	203,000	6.00	28.27	D	1	59	7,180
1216		6-3-83	90							
1217			90							
11:54 1218	3-5-83	6-3-83	90							

35. Standard Cylinder: ☑ 6" x 12" ☐ Cube ☐ Core ☐ Other
40. Remarks:

36. Age (Days)	37. Tested By	38. Checked By	39. Reviewed by Q.C.
28	[illegible]	GW	
60	BTET	RBB	

41. Laboratory Supervisor Signature:
42. Date:

Type of Breaks: A = Cone, Mortar Failure B = Cone, Aggregate Failure C = Shear, Mortar Failure D = Shear, Aggregate Failure E = Other

7220-QCF-39 Rev. 5

GI. .213

UST-M-76@7 UST-M-131@14 UST-M0-58@~~60~~60

BECHTEL POWER CORPORATION
MIDLAND NUCLEAR POWER PLANT JOB 7220

REPORT OF CONCRETE CYLINDERS

1. Placement Identification: "Trial Mix			2. Date Placed: 3-5-83
3. Placement Location: U.S. Testing			
3A. PLANT DATA Source: Allied Concrete Prod		Cement Brand & Type: Ultra Type I	
4. Mix: 3,B	5. Class: I	6. "Q" List: ☑ Yes ☐ No	7. Required Strength: 4,000 PSI At 28
8. Test Data At: Lab	9. Unit Weight ASTM-C-138-74: 153.40 Lbs/Ft³		10. Yield: 26.92
11. Moisture: Sand ASTM-C-566-67(72): 1.9 %	Stone 1: 0.5 %	Stone 2: N/A %	12. Water/Cement & Pozzolan Ratio: .37 Max .37 Ac
13. Ticket No.: 62971	14. Truck No.: 18	15. Time of Testing: 1023 Hrs at 2 Yards	16. Time of Molding: 1023 Hrs
17. Slump ASTM-C-143-74: 5½ Inches	18. Air Content ASTM-C-231-75: 1.2 %	19. Temp: Concrete: 64 °F	20. Temp: Air: 42 °F
21. Initials: BT, LH, DS			
22. Initial Curing ASTM-C-31-69; Therm/Due Date: 17 °F To 73 °F; 120 1, 24-83.		23. Stripped ASTM-C-31-69: 5-6-83 At 0450 Hrs	24. Initials: LH ST RA

COMPRESSIVE STRENGTH DATA ASTM-C-39-71

25. Specimen Identification	26. Date Molded	27. Date Tested	28. Age	29. Total Load in Pounds	30. Actual Cyl Diam	31. Actual Cyl Area	32. Type of Break	33. Cure: Field	33. Cure: Lab	34. Strength PSI
SP 1655 1219	3-5-83	3-6-83	1	101,000	5.99	28.18	A	1	0	3,580
1220			1	97,750	5.98	28.09	A	1	0	3,480
1221		3-6-83	1	102,500	5.98	28.09	A	1	0	3,650
1222		3-7-83	2	116,500	5.99	28.18	A	1	1	4,130
1223			2	114,250	5.99	28.18	A	1	1	4,050
1224		3-7-83	2	119,000	5.99	28.18	A	1	1	4,220
1225		3-8-83	3	120,500	6.00	28.27	A	1	2	4,260
SP 1655 1226	3-5-83	3-8-83	3	126,500	5.99	28.18	A	1	2	4,490

35. Standard Cylinder: ☑ 6" x 12" ☐ Cube ☐ Core ☐ Other

40. Remarks: IN MEASURING TEMP OUT OF SPEC TEMPERATURE TOO LOW, R.D. QC NOTIFIED, 4-15-83 @ 1452. TEMP 74° @ 1522 4-15-83

36. Age (Days)	37. Tested By	38. Checked By	39. Reviewed by Q.C.
1	LH RH	[signature]	N.A. 5-11-83
2	WM LH ST	[signature]	↓
3	WM, LH	[signature]	↓

41. Laboratory Supervisor Signature: | 42. Date:

Type of Breaks: A = Cone, Mortar Failure B = Cone, Aggregate Failure C = Shear, Mortar Failure D = Shear, Aggregate Failure E = Other

G/M-0213

7220-QCF-39 Rev. 5

UST-M-76@7 UST-M-121@14 UST-M0-5808

BECHTEL POWER CORPORATION
MIDLAND NUCLEAR POWER PLANT JOB 7220
REPORT OF CONCRETE CYLINDERS

1. Placement Identification: Trial Mix						2. Date Placed: 3-5-83	
3. Placement Location: U.S. Testing							
3A. PLANT DATA — Source: Allied Concrete Prod.				Cement Brand & Type: Ash Grove Type I			
4. Mix: 38	5. Class: I	6. "Q" List: ☑ Yes ☐ No		7. Required Strength: 4,[illegible] PSI At 28 Days			
8. Test Data At: Lab	9. Unit Weight ASTM-C-138-74: 153.40 Lbs/Ft³			10. Yield: 26.92			
11. Moisture: Sand ASTM-C-566-67(72): 1.4 %	Stone 1: 0.5 %	Stone 2: LA %		12. Water/Cement & Pozzolan Ratio: .37 Max .27 Act.			
13. Ticket No.: 62981	14. Truck No.: 18	15. Time of Testing: 1023 Hrs at 2 Yards		16. Time of Molding: 1023 Hrs			
17. Slump ASTM-C-143-74: 8 Inches	18. Air Content ASTM-C-231-75: 1.2 %	19. Temp: Concrete: 64 °F	20. Temp: Air: 42 °F	21. Initials: RT, LH, DC			
22. Initial Curing ASTM-C-31-69; Therm/Line Date: 68°F To 74°F; 62C / 3-24-83	23. Stripped ASTM-C-31-69 ~~3-7-83~~ 3-6-83 At 0450 Hrs			24. Inmals: JCW SJ, [illegible]			

COMPRESSIVE STRENGTH DATA ASTM-C-39-71 — 3-6-83

25. Specimen Identification	26. Date Molded	27. Date Tested	28. Age	29. Total Load in Pounds	30. Actual Cyl Diam	31. Actual Cyl Area	32. Type of Break	33. Cure: Field	33. Cure: Lab	34. Strength PSI
SP 1655 1227	3-5-83	3-8-83	3	126,000	6.00	28.27	A	1	2	4460
1228		3-12-83	7	154500	6.00	28.27	A	1	6	5470
1229		〃	7	149750	6.00	28.27	A	1	6	5300
1230		3-12-83	7	144250	6.01	28.37	A	1	6	5080
1231		3-19-83	14	157,000	5.98	28.09	A	1	13	5,590
1232		〃	14	172,000	5.99	28.18	B	1	13	6,100
1233		3-19-83	14	173,000	5.99	28.18	B	1	13	6,140
SP 1655 1234	3-5-83	4-2-83	28	185,400	6.00	28.27	B	1	27	6560

35. Standard Cylinder: ☑ 6" x 12" ☐ Cube ☐ Core ☐ Other

40. Remarks

36. Age (Days)	37. Tested By	38. Checked By	39. Reviewed by Q.C.
3	LH	RB	NA 3/11/83
7	LH	GW	
14	PB	RB	

41. Laboratory Supervisor Signature

42. Date

Type of Breaks: A = Cone, Mortar Failure B = Cone, Aggregate Failure C = Shear, Mortar Failure D = Shear, Aggregate Failure E = Other

C-213

7220-QCF-39 Rev. 5

UST-M-136 e 7 UST-M-131 @ 14 UST-M-130-58 @ 28

BECHTEL POWER CORPORATION
MIDLAND NUCLEAR POWER PLANT JOB 7220

REPORT OF CONCRETE CYLINDERS

1. Placement Identification: Trial Mix — 2. Date Placed: 3-5-83

3. Placement Location: U.S. Testing

3A. PLANT DATA — Source: Allied Concrete Prod. — Cement Brand & Type: Atlas Type I

4. Mix: 3B — 5. Class: I — 6. "Q" List: ☑ Yes ☐ No — 7. Required Strength: 4,000 PSI At 28 Days

8. Test Data At: Lab — 9. Unit Weight ASTM-C-138-74: 153.40 Lbs/Ft³ — 10. Yield: 26.92

11. Moisture: Sand ASTM-C-566-67(72): 1.9 % — Stone 1: 0.5 % — Stone 2: N/A % — 12. Water/Cement & Pozzolan Ratio: .37 Max .37 Act.

13. Ticket No.: 62981 — 14. Truck No.: 18 — 15. Time of Testing: 1023 Hrs at 2 Yards — 16. Time of Molding: 1023 Hrs

17. Slump ASTM-C-143-74: 8 Inches — 18. Air Content ASTM-C-231-75: 1.2 % — 19. Temp: Concrete: 64 °F — 20. Temp: Air: 42 °F — 21. Initials: BT, LH, DS

22. Initial Curing ASTM-C-31-69; Therm/Due Date: 60°F To 74°F; 620 / 9-24-83 — 23. Stripped ASTM-C-31-69: 3-6-83 At 0450 Hrs — 24. Initials

COMPRESSIVE STRENGTH DATA ASTM-C-39-71

25. Specimen Identification	26. Date Molded	27. Date Tested	28. Age	29. Total Load in Pounds	30. Actual Cyl Diam	31. Actual Cyl Area	32. Type of Break	33. Cure: Field	33. Cure: Lab	34. Strength PSI
SP 1625 1235	3-5-83	4-2-83	28	181,750	6.00	28.27	A	1	27	6430
1236		4-2-83	28	185,750	6.00	28.27	A	1	27	6570
1237		5-4-83	60	207,000	5.99	28.15	B	1	59	7,350
1238		"	60	203,000	5.99	28.18	B	1	59	7,200
1239		5-4-83	60	210,000	5.99	28.12	B	1	59	7,450
1240		6-3-83	90							
1241		"	90							
SP 1655 1242	3-5-83	6-3-83	90							

35. Standard Cylinder: ☑ 6" x 12" ☐ Cube ☐ Core ☐ Other

40. Remarks

36. Age (Days)	37. Tested By	38. Checked By	39. Reviewed by Q.C.
28	TT	GW	N/A 5-11-83
60	ET, BT	RBB	

41. Laboratory Supervisor Signature — 42. Date

Type of Breaks: A = Cone, Mortar Failure B = Cone, Aggregate Failure C = Shear, Mortar Failure D = Shear, Aggregate Failure E = Other

7220-QCF-39 Rev. 5

-0213

UST-M-2607 UST-M-1910 14 Unit No. 5802

DRAFT

BECHTEL POWER CORPORATION
MIDLAND NUCLEAR POWER PLANT JOB 7220

REPORT OF CONCRETE CYLINDERS

1. Placement Identification: Truck Mix.			2. Date Placed: 3-5-83
3. Placement Location: U.S. Testing			
3A. PLANT DATA Source: Ready Mix Concrete Prod.		Cement Brand & Type: Ash Grove Type I	
4. Mix: 5G	5. Class: I	6. "Q" List: ☒ Yes ☐ No	7. Required Strength: 4000 PSI At 28 Days
8. Test Data At: Lab	9. Unit Weight ASTM-C-138-74: 153.6 Lbs/Ft³	10. Yield: 26.95	
11. Moisture: Sand ASTM-C-566-67(72): 1.7 %	Stone 1: 0.5 %	Stone 2: NA %	12. Water/Cement & Pozzolan Ratio: .41 Max .41 Act.
13. Ticket No.: 62984	14. Truck No.: 18	15. Time of Testing: 1156 Hrs at 2 Yards	16. Time of Molding: 1156 Hrs
17. Slump ASTM-C-143-74: 7½ Inches	18. Air Content ASTM-C-231-75: 1.6 %	19. Temp: Concrete: 65 °F	20. Temp: Air: 44 °F
21. Initials: DE, LH, BT			
22. Initial Curing ASTM-C-31-69: 68 °F To 74 °F; Therm/Due Date: 620 / 8-24-83	23. Stripped ASTM-C-31-69: 3-6-83 At 0715 Hrs	24. Initials: RB RH	

COMPRESSIVE STRENGTH DATA ASTM-C-39-71

25. Specimen Identification	26. Date Molded	27. Date Tested	28. Age	29. Total Load in Pounds	30. Actual Cyl Diam	31. Actual Cyl Area	32. Type of Break	33. Cure: Field	33. Cure: Lab	34. Strength PSI
SP 1657 1267	3-5-83	3-6-83	1	86,050	6.00	28.27	A	1	0	3,040
1268		"	1	85,000	5.98	28.09	A	1	0	3,030
1269		3-6-83	1	81,750	5.98	28.09	A	1	0	2,910
1270		3-7-83	2	106,500	5.98	28.09	A	1	1	3,790
1271		"	2	108,500	6.00	28.27	A	1	1	3,840
1272		3-7-83	2	109,500	5.98	28.09	A	1	1	3,900
1273		3-8-83	3	118,000	5.98	28.09	A	1	2	4,200
SP 1657 1274	3-5-83	3-8-83	3	110,500	5.98	28.09	C	1	2	3,930

35. Standard Cylinder: ☒ 6" x 12" ☐ Cube ☐ Core ☐ Other

40. Remarks

36. Age (Days)	37. Tested By	38. Checked By	39. Reviewed by Q.C.
1	LH RH	RB GT	N.A. 3/10/83
2	PB, TC, WM	RB GT	
3	WM LH	RB GT	

41. Laboratory Supervisor Signature

42. Date

Type of Breaks: A = Cone, Mortar Failure B = Cone, Aggregate Failure C = Shear, Mortar Failure D = Shear, Aggregate Failure E = Other

-0213

7220-QCF-39 Rev. 5

UST-1776.07 UST-M-1310.14 UST-MD-596&1260

BECHTEL POWER C PORATION
MIDLAND NUCLEAR POWER PLANT JOB 7220

REPORT OF CONCRETE CYLINDERS

1. Placement Identification: Trial Mix				2. Date Placed: 3-5-83	
3. Placement Location: U.S. Testing					
3A. PLANT DATA — Source: Allied Concrete Prod			Cement Brand & Type: Ultra Type I		
4. Mix: 5E	5. Class: I	6. "Q" List: ☑ Yes ☐ No	7. Required Strength: 4,000 PSI	At: 28 Days	
8. Test Data At: Lab	9. Unit Weight ASTM-C-138-74: 153.69 Lbs/Ft³		10. Yield: 26.95		
11. Moisture: Sand ASTM-C-566-67(72): 1.9 %	Stone 1: 0.5 %	Stone 2: LA %	12. Water/Cement & Pozzolan Ratio: .41 Max	.41 Act.	
13. Ticket No.: 62984	14. Truck No.: 18	15. Time of Testing: 1156 Hrs at 2 Yards	16. Time of Molding: 1156 Hrs		
17. Slump ASTM-C-143-74: 7½ Inches	18. Air Content ASTM-C-231-75: 1.6 %	19. Temp: Concrete: 62 °F	20. Temp: Air: 44 °F	21. Initials: DE, LH, PT	
22. Initial Curing ASTM-C-31-69; Therm/Due Date: 67 °F To 74 °F; 120 / 4-24-83		23. Stripped ASTM-C-31-69: 3-6-83 At 0715 Hrs		24. Initials: RB LH SJ	

COMPRESSIVE STRENGTH DATA ASTM-C-39-71

25. Specimen Identification	26. Date Molded	27. Date Tested	28. Age	29. Total Load in Pounds	30. Actual Cyl Diam	31. Actual Cyl Area	32. Type of Break	33. Cure: Field	33. Cure: Lab	34. Strength PSI
SF 1657 1275	3-5-83	3-8-83	3	111,500	5.99	28.18	A	1	2	3,960
1276		3-12-83	7	137000	6.00	28.27	A	1	6	4850
1277		)	7	138500	5.99	28.18	A	1	6	4910
1278		3-12-83	7	137500	6.00	28.27	A	1	6	4860
1277		3-19-83	14	147,500	6.00	28.27	C	1	13	5,220
1280		)	14	157,500	5.98	28.09	A	1	13	5,610
1281		3-19-83	14	155,000	5.99	28.18	B	1	13	5,480
SF 1657 1282	3-5-83	4-2-83	28	166,000	5.99	28.18	A	1	27	5890

35. Standard Cylinder: ☑ 6" x 12" ☐ Cube ☐ Core ☐ Other

40. Remarks

36. Age (Days)	37. Tested By	38. Checked By	39. Reviewed by Q.C.
3	WM LH		N.A
7	TI SL PB DT	GW LH RBC	
14			

41. Laboratory Supervisor Signature

42. Date

Type of Breaks: A = Cone, Mortar Failure B = Cone, Aggregate Failure C = Shear, Mortar Failure D = Shear, Aggregate Failure E = Other

7220-QCF-39 Rev. 5

UST-M-76@7 UST-M-131@14 UST-M-51@28(c)

-0213

BECHTEL POWER C ORATION
MIDLAND NUCLEAR POWER PLANT JOB 7220

REPORT OF CONCRETE CYLINDERS

1. Placement Identification: Trial Mix				2. Date Placed: 3-5-83
3. Placement Location: U.S. Testing				
3A. PLANT DATA Source: Allied Concrete Prod.			Cement Brand & Type: Atlas Type I	
4. Mix: 5B	5. Class: I	6. "Q" List: ☒ Yes ☐ No	7. Required Strength: 4,000 PSI	At 28 Days
8. Test Data At: Lab	9. Unit Weight ASTM-C-138-74: 152.69 Lbs/Ft³		10. Yield: 26.95	
11. Moisture: Sand ASTM-C-566-67(72): 1.9 %	Stone 1: 0.5 %	Stone 2: NA %	12. Water/Cement & Pozzolan Ratio: .41 Max	.41 Act.
13. Ticket No.: 62984	14. Truck No.: 18	15. Time of Testing: 1156 Hrs at 2 Yards		16. Time of Molding: 1156 Hrs
17. Slump ASTM-C-143-74: 7½ Inches	18. Air Content ASTM-C-231-75: 1.4 %	19. Temp: Concrete: 62 °F	20. Temp: Air: 44 °F	21. Initials: LH, ES, BT
22. Initial Curing ASTM-C-31-69; Therm/Due Date: 62°F To 74°F; Dec / 8-24-83		23. Stripped ASTM-C-31-69: 3-6-83 At 0715 Hrs		24. Initials: RB RH ST

COMPRESSIVE STRENGTH DATA ASTM-C-39-71

25. Specimen Identification	26. Date Molded	27. Date Tested	28. Age	29. Total Load in Pounds	30. Actual Cyl Diam	31. Actual Cyl Area	32. Type of Break	33. Cure: Field	33. Cure: Lab	34. Strength PSI
SF 1657 1283	3-5-83	4-2-83	28	167,000	6.00	28.27	A	1	27	5910
1284		4-2-83	28	168,000	5.99	28.19	A		27	5960
1285		5-4-83	60	186,000	6.00	28.27	B	1	59	6,580
1286		"	60	192,000	6.00	28.27	B	1	59	6,790
1287		5-4-83	60	191,000	5.98	28.09	B	1	59	6,800
1288		6-3-83	90							
1289		"	90							
SF 1657 1290	3-5-83	6-3-83	90							

35. Standard Cylinder: ☒ 6" x 12" ☐ Cube ☐ Core ☐ Other

40. Remarks: IMMERSION CURING TEMP OUT OF SPEC. TEMP TOO LOW. P.O. QC NOTIFIED 4-15-83 @ 1457. TEMP 74° @ 1522 4-15-83

36. Age (Days)	37. Tested By	38. Checked By	39. Reviewed by Q.C.
28	TT	GW	NA GW 8483
60	BT	RB	

41. Laboratory Supervisor Signature | 42. Date

Type of Breaks: A = Cone, Mortar Failure B = Cone, Aggregate Failure C = Shear, Mortar Failure D = Shear, Aggregate Failure E = Other

7220-QCF-39 Rev. 5

-0213

UST-M-24 @ 7 UST-131 @ 14 UST-[illegible]

Consumers Power Company

J A Mooney
Executive Manager
Midland Project Office

General Offices: 1945 West Parnall Road, Jackson, MI 49201 • (517) 788-0774

June 10, 1983

PRINCIPAL STAFF			
RA		ENF	
D/RA		SCS	
A/RA		PAO	
[illegible]		SLO	
[illegible]		RO	
[illegible]			
DE			
NL			
SL		FILE	

orig+3 letter

letter only

attachments sent to SCS

Mr J J Harrison
Midland Project Section
U S Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

MIDLAND ENERGY CENTER GWO 7020
REMEDIAL SOILS WORK AUTHORIZATION
File: 0485.16 UFI: 42*05*22*04 Serial: CSC-6738
12*32

As per discussions with the NRC during their May 11 and 12 site visit, attached is a report on the evaluation of the continuous sampling borings in the Service Water Pump Structure (SWPS) area. This evaluation is based on the first six borings. The report summarizes our findings included are boring logs, piezometer installation details, etc.

Based on this evaluation CPCo has determined to install the SWPS dewatering wells to elevation 570 feet. It should be noted that the NRR had suggested this elevation at the June 25, 1982 meeting, in Bethesda MD, in lieu of the investigation of the initial borings.

Based on our review, we concluded that we are ready to start work:

207050605 - Install Remaining Ejector Wells
207050600 - Install Piezometers

According to the NRC/CPCo Work Authorization Procedure, we request authorization for the above activities.

/JAMooney

JAM/DWP/klm

Attachments (3) copies

JUN 20 1983

8306270242

INTRODUCTION

Six exploratory borings have been drilled prior to the installation of the construction dewatering system for the Service Water Pump Structure (SWPS) underpinning. Piezometers were installed in five of the borings and a construction dewatering well was installed in the remaining boring, which is currently being used as an observation well. All work was performed in accordance with the appropriate revisions to Specification C-[illegible]4(Q), Bechtel Design Drawings and Spencer, White & Prentis Procedure SWP [illegible].000.

PURPOSE

The purpose of the first six borings is to:

1. Determine the stratigraphy below the bottom of the proposed footings of the SWPS to provide assurances that blowouts will not occur at the base of the pier excavations.

2. Based on the stratigraphy, determine the depth of the construction dewatering wells so that groundwater levels are maintained a minimum of two feet below the bottom of the underpinning excavation.

3. Install piezometers in the borings to verify that the groundwater is being maintained at least two feet below the bottom of the underpinning excavation.

INSTALLATION

The borings are located primarily along the south side of the SWPS, nearest the cooling pond in areas where little geotechnical data previously existed (Figure GSK-SWP1). Soil sampling was begun in the backfill to determine the backfill/natural soil interface. Continuous soil sampling was conducted between elevation 585 and 570. Five of the borings (LS-6, LS-12, 555, 561, 576) were installed as piezometers. Each piezometer consists of a slotted 0.018", one-half inch I.D. PVC piezometer, three feet long sealed with grout in the natural soils below elevation 590. One of the borings (567) was installed as a construction dewatering well because only three thin silty sand layers were encountered. The well is screened from elevation 568.7 to 614.8 and is being used as an observation well to monitor groundwater levels in the backfill. Well 567 is positioned between piezometers LS-12 and 561 which are sealed in the till. A sixth piezometer was not installed since the work package approved by the NRC was only for six holes. Installation details, including boring logs, are presented in Appendix A.

STRATIGRAPHY

The contact between the backfill and the till ranges from elevation 588± along the south side of the cantilever to elevation 600± along the north side (Figure GSK-SWP2). Along the north side the soil consists primarily of till with small channels of lacustrine sand that thicken to the north and pinch out to the south beneath the structure. (Figure GSK-SWP3). These sand layers are hydraulically connected to the lacustrine sands that are being dewatered by the permanent wells. Along the south side only thin discontinuous layers of silty sand were encountered in the till. The only boring to encounter a significant amount of natural sand was LS-6 located on the north side of the structure in a lacustrine sand layer (Figure GSK-SWP2).

PERMEABILITY

Response tests (falling or rising head) were conducted in the piezometers. A permeability was calculated for each test:

Number	Permeability (ft/yr.)
LS-6	16.8
LS-12	7.9
555	6.2
561	4.7
576	26.1

The results correspond to low to very low permeabilities.

GROUNDWATER LEVELS

Groundwater levels in the backfill range from elevation 613 to 621 beneath the cantilevered portion of the SWPS. The levels are being affected by the operation of the 20 permanent wells and 6 temporary of wells (Figure GSK-SWP4).

The water level in LS-6 (el. 580±) is influenced by the operation of the permanent dewatering system since it is in the lacustrine sand and the water levels are close to the pumping levels in the permanent dewatering wells.

The initial water levels in the remaining four piezometers (LS-12, 555, 561 and 576) approximate the groundwater levels in the backfill (Figure GSK-SWP4). In reviewing the boring logs it is not reasonable to assume that the thin discontinuous sand layers in the till are hydraulically connected to the backfill. A more likely cause is that the water levels have not yet stabilized because of the low permeability of the soils or the grout seals are not functioning as intended.

RECOMMENDATIONS

Although it is very unlikely that there is sufficient head in the till to cause blowouts in the pier excavations, it is recommended that all construction dewatering wells be installed to a minimum elevation of 570. Elevation 570 will provide an adequate factor of safety against blowout since at least 13 feet of hard till will exist beneath the footings based on the deepest pier excavation of elevation 583. It should be noted that on June 25, 1982 the NRR suggested that as alternative to drilling and evaluating the results of the initial six borings, CPCo could install the SWPS construction dewatering wells to elevation 570.

Additional observation wells and piezometers will be installed by the subcontractor to enhance the water level monitoring capabilities in the backfill and natural materials (Figure GSK-SWP1).

APPENDIX A

BORING LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
MIDLAND UNITS 1 & 2	7220-101	1 of 2	LS-6

SITE	COORDINATES	ANGLE FROM HORIZ.	BEARING
Service Water Pump Structure	S 5011.81 E 732.92	90°	NA

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	HOLE SIZE	OVERBURDEN (FT.)	ROCK (FT.)	TOTAL DEPTH
4/4/83	4/12/83	Loughney Dewatering	Sprague-Henwood Skid Rig	0-57'/6" 57'-71.7'/4-7/8"	NA	NA	71.7'

CORE RECOVERY/FT./%/RQD	CORE BOXES	SAMPLES	EL. TOP OF CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
NA	NA	23	636.2	634.2	60.7'/573.5	NA

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./DEPTH	LOGGED BY
140 lbs./30 in.	1/2" /67.9'	D. Henderson/ A. Fiksdal/ T. Cullen

DRILL TYPE AND DIAMETER	SAMPLER, ADVANCE, LENGTH CORE BBL	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS "N" PERCENT CORE RECOVERY	PENETRATION BLOWS 1ST 6"	2ND 6"	3RD 6"	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							634.2	0			0-7.5' Sand and Gravel, brown. (GP)(Fill)	0-57.0' Drilled with 5-7/8" tri-cone rollerbit and re-circulating Johnson revert drilling fluid. Installed 6" I.D. casing to 57.0', flushed casing with water and took sample 13. Drove 4" I.D. casing to 57.8', flushed casing with water and took sample 14, 15 and 16. Drove casing from 57.8' to 62.5'. Used the following method between 62.5'-70.3': Drove SS sampler, advanced casing and washed casing with water. 0-25.7' No samples taken. Soil description based on drilled cuttings and drilling conditions.
							626.7	7.5			7.5-25.0' Sand, brown, medium-to coarse-grained, trace of gravel. (SP)(Fill) 9.0' gravel layer.	
								25				
2" SS	18"	14"	34	7	11	23	609.2			1	25.0-31.0' Silty Sand, gray-brown, dense, fine-grained, moist, trace of fine gravel, trace of clay. (SM)(Fill)	Hard drilling at 25.7'
								30			31.0' gravel layer.	Fill
2" SS	10"	10"	100+	46	54/4"	-	603.2	31		2	31.0-36.2' Silty Sand, gray-brown, dense, fine-grained, moist, trace of fine gravel. (SM)(Till)	Till Very hard drilling from 31.1'-33.0'
							599.2	35				

FOR INFORMATION ONLY

SS-SPLIT SPOON; ST-SHELBY TUBE; D-DENNISON; P-PITCHER; O-OTHER

SITE: Service Water Pump Structure

HOLE NO.: LS-6

BORING LOG

PROJECT: MIDLAND UNITS 1 & 2 | JOB NO. 7220-101 | SHEET NO. 2 of 2 | HOLE NO. LS-6

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE (CORE RUN)	SAMPLE RECOVERY (CORE RECOVERY)	SAMPLE BLOWS "N" PERCENT CORE RECOVERY	PENETRATION BLOWS 1ST 6"	2ND 6"	3RD 6"	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							599.2	35				
2"S	18"	18"	188	24	44	65	598.0	36.2		3	36.2-41.0' Sandy Silt, gray, very dense, moist, trace of fine gravel, trace of clay. (ML)(Till)	
								40				41.0'-2" Silty clay curve-linear, sandy silt, ½" lens
2"SS	18"	18"	118	30	48	70	593.2	41		4	41.0-44.0' Silty Sand, gray, fine-to medium-grained, very dense, moist, trace of fine gravel. (SM)(Till)	Till
							590.2	44				Locustrine
								45			44.0-45.9' Sand, gray, fine-grained dense, moist, some silt, ½" layer of black organic clay. (SP)(Locustrine)	Locustrine
2"SS	10"	8"	100+	39	100/4"	-	588.3	45.9		5	45.9-57.5' Sandy Silt, gray, fine-grained, very dense, moist, trace of clay, trace of fine to medium gravel, trace of coarse sand. (ML)(Till)	Till
2"SS	16"	16"	192	55	77	115				6		Sample 5: stone lodged in tip of sampler
2"SS	18"	17"	137	30	68	69				7		
2"SS	18"	18"	193	24	72	121		50		8	45.9-48.7' Occasional brown, fine sand pockets.	
2"SS	18"	18"	163	26	69	94				9	48.3' ½" layer of black, organic clay.	Sample 9: tested for Atterberg limits.
2"SS	18"	18"	160	33	66	94				10		
2"SS	18"	18"	215	33	61	154		55		11	55.3' Rounded, fine gravel.	3rd blowcount Sample 11: was affected by gravel layer at 55.3'
2"SS	18"	18"	159	32	78	89				12		Till
2"SS	12"	8"	155+	87	155	-	576.7	57.5		13	57.5-59.3' Sand, gray-brown, fine-to medium-grained, very dense, moist, trace of coarse sand, trace of silt. (SP)(Locustrine) 59.0-59.3' silty sand seam	Locustrine
2"SS	18"	18"	238	76	118	120	574.9	59.3		14		Sample 13: pushed a stone
2"SS	18"	18"	187	45	45	62		60		15	59.3-61.9' Clayey Silt, gray, hard, moist, trace of fine-to coarse-grained sand, occasional fine sand seams ¼"-1" thick, less frequent at bottom of sample. (ML)(Till) 61.9 black, organic clay seam.	Locustrine Till ▽ 4/14/83
2"SS	18"	18"	140	28	34	106	572.3	61.9		16		
2"SS	14"	9"	187+	21	87	100/2"	571.5	62.7		17		Till
2"SS	15"	0"	261+	59	161	100/3"	569.7	64.5		18	61.9-62.7' Sand, brown, fine-to medium-grained, very dense, wet, trace of fine gravel. (SP)(Locustrine)	Locustrine
2"SS	12"	0"	250+	37	250	-		65		19		64.5-71.7' Losing water at a rate of 1 foot/65 sec.
2"SS	6"	0"	100+	100	100/2"	-				20	62.7-64.5' Silty Clay, brown to gray, medium to high plasticity, hard, moist. (CL-CH)(Locustrine)	
2"SS	18"	0"	591	75	180	401				21		
3"SS	12"	3"	148+	129	148	-				22	64.5-71.7' Sand, gray, very dense, fine-grained, trace of silt, trace of medium-grained sand, trace of gravel. (SP)(Locustrine)	Samples 22 and 23 -3" split spoon sampler driven by 315 lb. hammer was used to obtain sample recovery.
								70				
3"SS	17"	2"	405+	95	200	205/5"	562.5	71.7		23		
											Bottom of boring at 71.7'. Piezometer installed - see Observation Well Construction Summary.	

FOR INFORMATION ONLY

SS=SPLIT SPOON; ST=SHELBY TUBE; D=DENISON; P=PITCHER; O=OTHER

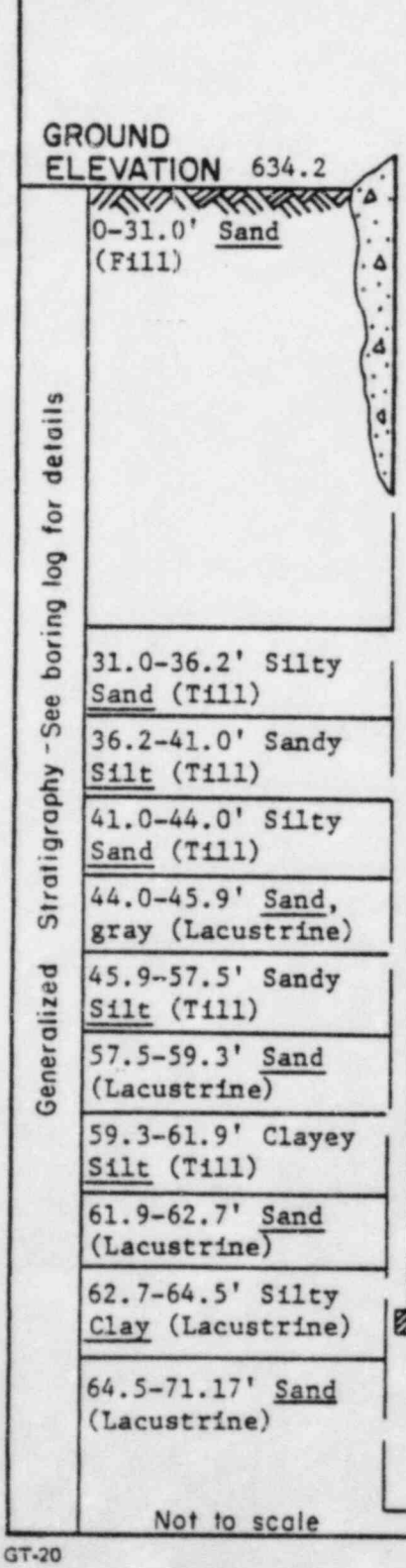
SITE: Service Water Pump Structure

HOLE NO. LS-6

OBSERVATION WELL CONSTRUCTION SUMMARY

PROJECT Midland Units 1 & 2
SITE Service Water Pump Structure
COORDINATES S5011.01 E732.92
DATE COMPLETED 4/13/83
SUPERVISED BY D. Henderson/T. Cullen

WELL NO. LS-6
AQUIFER Sand (Lacustrine)



Elevation of reference point	636.2
Height of reference point above ground surface	2.0'
Depth of surface seal	44.0'
Type of surface seal: PGB grout	
I. D. of surface casing	NA
Type of surface casing: NA	
Depth of surface casing	NA
I. D. of riser pipe	1/2"
Type of riser pipe: Schedule 80 PVC with threaded couplings	
Diameter of borehole	0-57.0'/6" 57.0-71.7'/4 1/2"
Type of filler: NA	
Type of gravel pack Ottawa Flint Shot Sand	
Elev./depth of top of gravel pack	590.2/44.0'
Elevation/depth of top of screen	571.3/62.9'
Description of screen #18 Commercially slotted PVC pipe	
I. D. of screen section	1/2"
Elevation / depth of bottom of screen	568.3/65.9'
Elev./depth of bottom of plugged blank section	NA
Elev./depth of bottom of gravel pack	565.0/69.2'
Type of filler below plugged section Ottawa Flint Shot Sand	
Elevation of bottom of borehole	562.5

GT-20

WELL INSTALLATION DATA SHEET

WELL NUMBER LS-6

PROJECT Midland Units 1 & 2 JOB NO. 7220-101 SUBCONTRACTOR Loughney Dewatering Co.

COORDINATES S5011.01 E732.92 SURFACE ELEVATION 634.2

DATE STARTED 4-4-83 DATE COMPLETED 4-13-83 NO. OF SAMPLES 23

TYPE OF SAMPLES 2" Split Spoon/3" Split Spoon

DRILLING PROCEDURE

CASING DIAMETERS (IN)
O.D. 4 1/2"
I.D. 4"

DRILLING METHOD Rotary
HOLE DIAMETER 6"/4 1/2" HOLE DEPTH 71.7'
SPECIAL CONDITIONS used 3" Split Spoon/315# hammer 68.0-71.7'

WELL INSTALLATION

SCREEN SLOT SIZE 0.018" SCREEN DIAMETER 1/2" SCREEN LENGTH 3.0'
CENTRALIZERS: 65.0'

LENGTH OF BLANK BELOW SCREEN NA LENGTH OF RISER ABOVE SCREEN 64.9'
LENGTH OF GRAVEL PACKED ZONE 25.2' CALCULATED AMOUNT OF GRAVEL PACK 3.81 cu.ft.
ACTUAL AMOUNT OF GRAVEL PACK 2.56 cu.ft.

THICKNESS OF SEAL 44.0'
TYPE OF SEAL PGB grout CALCULATED AMOUNT OF SEAL 8.47 cu.ft.
ACTUAL AMOUNT OF SEAL 10.15 cu.ft.

WELL DEVELOPMENT

TYPE OF DEVELOPMENT NA
DEVELOPING TIME AMOUNT OF MATERIAL REMOVED (est)
SAND CONCENTRATION: (ppm by weight)
DURING DEVELOPMENT
FIRST RETEST
SECOND RETEST
THIRD RETEST

SPECIAL CONDITIONS Performed falling head test to verify that piezometer was functioning properly

STATIC WATER LEVEL Elev. 573.5 DATE 4-14-83 EDUCTOR SETTING NA

SUBCONTRACTOR SUBMITTALS:

MICHIGAN DEWATERING WELL RECORD ☐

SUPERVISED BY
GEOLOGIST/HYDROGEOLOGIST T. Cullen

BORING LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
MIDLAND UNITS 1 & 2	7220	1 of 2	LS-12

SITE	COORDINATES	ANGLE FROM HORIZ.	BEARING
SERVICE WATER PUMP STRUCTURE	S 5040.07 E 769.12	90°	NA

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	HOLE SIZE	OVERBURDEN (FT.)	ROCK (FT.)	TOTAL DEPTH
5/10/83	5/13/83	LOUGHNEY DEWATERING	ACKER-SKID RIG	4 1/2"	NA	NA	50.5'

CORE RECOVERY(FT./%)	CORE BOXES	SAMPLES	EL. TOP OF CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
NA	NA	17	622.17	620.17	1.2'/618.8	NA

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
140 LBS./30 IN.	1/2" / 51.7'	P. LARSEN

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE/ LENGTH CORE RUN	SAMPLE RECOVERY/ CORE RECOVERY	SAMPLE BLOWS "N" / PERCENT CORE RECOVERY	PENETRATION BLOWS 1ST 6"	PENETRATION BLOWS 2ND 6"	PENETRATION BLOWS 3RD 6"	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							620.0	0			0-3.0' CONCRETE, FOUNDATION SLAB.	▽ 5/13/83
							617.0	3.0			3.0-3.75' CONCRETE, MUDMAT.	INSTALLED 6" DIA. CASING AT TOP OF FLOOR TO CORE CONCRETE. TOP OF 6" DIA. CASING AT EL. 622.0.
2" SS	18"	12"	14	2	6	8	616.25 / 615.5	3.75 / 4.5 / 5		1	3.75-4.5' SAND, BROWN, FINE-TO MEDIUM-GRAINED, LOOSE, WET, TRACE OF SILT, (SP)(FILL)	0-4.0' CORED USING 5-1/8" O.D. CONCRETE CORE BARREL. GROUND-WATER LEVEL STABILIZED AT EL. 618.8 AFTER CORING THROUGH CONCRETE.
											4.5-9.5' SILTY CLAY, BROWN, STIFF, LOW PLASTICITY, TRACE TO SOME SAND, TRACE GRAVEL, OCCASIONAL SAND LAYERS. (CL)(FILL)	
2" SS	18"	10"	38	5	18	20	610.5	9.5 / 10		2	9.5-34.5' SAND, BROWN, FINE-TO COARSE-GRAINED, DENSE, WET, TRACE OF SILT AND GRAVEL, WITH OCCASIONAL SILTY CLAY LAYERS. (SP)(FILL)	3.75-50.5' HOLE ADVANCED BY DRIVING 4-1/2" O.D. CASING AND CLEANING OUT WITH A 3-1/8" TRICONE ROLLER BIT USING FRESH WATER.
2" SS	18"	6"	2	2	1	1		15		3		
											15.5-34.5' MEDIUM DENSE TO VERY DENSE	
2" SS	24"	5"	24	6	7	17		20		4		SAMPLE 4- NO RECOVERY ON FIRST TRY, REDROVE AN ADDITIONAL 6".
2" SS	18"	12"	92	49	46	46		25		5		SAMPLE 6- 1" DIAMETER GRAVEL WAS CONTAINED IN SAMPLE.
2" SS	18"	9"	84	31	40	44		30		6		
2" SS	18"	9"	76	35	34	42	585.5 / 584.0	34.5 / 35		7	FILL / TILL	

SS-SPLIT SPOON; ST-SHELBY TUBE; D-DENNISON; P-PITCHER; O-OTHER

BORING LOG

PROJECT: MIDLAND UNITS 1 & 2 | JOB NO. 7220 | SHEET NO. 2 of 2 | HOLE NO. LS-12

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE LENGTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS / PERCENT CORE RECOVERY	PENETRATION BLOWS 1ST 6"	PENETRATION BLOWS 2ND 6"	PENETRATION BLOWS 3RD 6"	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON WATER LEVELS, WATER RETURNS, CHARACTER OF DRILLING, ETC.
							585.0	35				
2" SS	18"	18"	108	34	42	66				8	34.5-38.5' SANDY SILT, GRAY, VERY DENSE, WET, TRACE OF CLAY AND GRAVEL. (ML) (TILL)	
2" SS	18"	18"	130	33	54	76				9		
2" SS	18"	18"	133	34	55	78	581.5 581.3	38.5 38.7		10	38.5-38.7' SILTY SAND, GRAY, FINE TO COARSE-GRAINED, VERY DENSE, WET, (SM) (TILL)	
2" SS	18"	18"	138	38	62	76		40		11	38.7-47.0' SANDY SILT, GRAY, VERY DENSE, WET, TRACE OF CLAY AND GRAVEL. (ML) (TILL)	
2" SS	18"	18"	127	32	56	71				12		
2" SS	18"	18"	117	33	45	72				13		
2" SS	18"	18"	116	31	51	65		45		14	574.5 1/4" SILTY SAND SEAM	
2" SS	18"	12"	140	34	50	90	573.0	47.0		15	47-47.5' SILTY SAND, GRAY, FINE-GRAINED, VERY DENSE, WET. (SM) (TILL)	DROVE 4" I.D. CASING TO EL. 569.5 AND WASHED CASING OUT FOR ONE HOUR WITH FRESH WATER
2" SS	18"	18"	117	33	47	70	572.5	47.5		16	47.5-50.5' SANDY SILT, GRAY, VERY DENSE, WET, TRACE OF CLAY AND GRAVEL. (ML) (TILL)	
2" SS	18"	18"	122	47	52	70	569.5	50 50.5		17		
											BOTTOM OF BORING AT 50.5' PIEZOMETER INSTALLED. SEE OBSERVATION WELL SUMMARY.	

FOR INFORMATION ONLY

SS-SPLIT SPOON; ST-SHELBY TUBE; D-DENNISON; P-PITCHER; O-OTHER

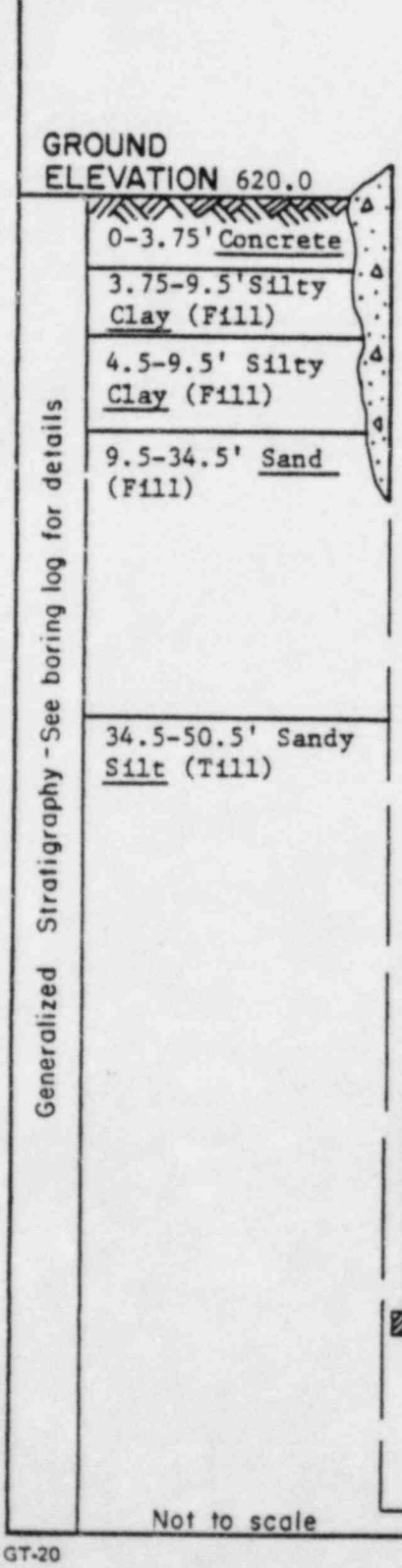
SITE: SERVICE WATER PUMP STRUCTURE

HOLE NO. LS-12

OBSERVATION WELL CONSTRUCTION SUMMARY

PROJECT Midland Units 1 & 2
SITE Service Water Pump Structure
COORDINATES S5040.07 E769.12
DATE COMPLETED 5-26-83
SUPERVISED BY D. Henderson

WELL NO. LS-12
AQUIFER T111



Elevation of reference point	622.17
Height of reference point above ground surface	2.17'
Depth of surface seal (from 3.40' below top of slab)	33.05'
Type of surface seal: PGB Grout	
I. D. of surface casing	NA
Type of surface casing: NA	
Depth of surface casing	NA
I. D. of riser pipe	1/2"
Type of riser pipe: Schedule 80 PVC with threaded couplings	
Diameter of borehole	4 1/2"
Type of filler: NA	
Type of gravel pack Ottawa Flint Shot Sand	
Elev./depth of top of gravel pack	583.5/36.5
Elevation/depth of top of screen	574.1/45.9
Description of screen #18 commercially slotted schedule 80 PVC pipe	
I. D. of screen section	1/2"
Elevation / depth of bottom of screen	571.1/48.9'
Elev./depth of bottom of plugged blank section	NA
Elev./depth of bottom of gravel pack	569.5/50.5'
Type of filler below plugged section Ottawa Flint Shot Sand	
Elevation of bottom of borehole	569.5

GT-20

WELL INSTALLATION DATA SHEET

WELL NUMBER LS-12

ROJECT Midland Units 1 & 2 JOB NO. 7220-101 SUBCONTRACTOR Loughney Dewatering Co.

OORDINATES S5040.07 E769.12 SURFACE ELEVATION 620.0

ATE STARTED 5-10-83 DATE COMPLETED 5-26-83 NO. OF SAMPLES 17

YPE OF SAMPLES 2" Split Spoon

DRILLING PROCEDURE

ASING DIAMETERS (IN)
O.D. 4 1/2"
I.D. 4"

DRILLING METHOD Rotary
HOLE DIAMETER 4 1/2" HOLE DEPTH 50.5'
SPECIAL CONDITIONS

WELL INSTALLATION

CREEN SLOT SIZE 0.018" SCREEN DIAMETER 1/2" SCREEN LENGTH 3.0'
ENTRALIZERS: 50.5'

ENGTH OF BLANK BELOW SCREEN NA LENGTH OF RISER ABOVE SCREEN 48.07'
ENGTH OF GRAVEL PACKED ZONE 14.0' CALCULATED AMOUNT OF GRAVEL PACK 1.51 cu.ft.
CTUAL AMOUNT OF GRAVEL PACK 1.54cu.ft.

THICKNESS OF SEAL 33.1'
YPE OF SEAL PGB Grout CALCULATED AMOUNT OF SEAL 3.55 cu.ft.
CTUAL AMOUNT OF SEAL 4.40 cu.ft.

WELL DEVELOPMENT

YPE OF DEVELOPMENT NA
EVELOPING TIME AMOUNT OF MATERIAL REMOVED (est)
AND CONCENTRATION: (ppm by weight)
URING DEVELOPMENT
IRST RETEST
ECOND RETEST
HIRD RETEST

SPECIAL CONDITIONS Piezometer installed to monitor groundwater level in the Till and rising head test performed.

TATIC WATER LEVEL Elev. 616.79 DATE 5-26-83 EDUCTOR SETTING NA

UBCONTRACTOR SUBMITTALS:

ICHIGAN DEWATERING WELL RECORD ☐

SUPERVISED BY
GEOLOGIST/HYDROGEOLOGIST D. Kosco

BORING LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
MIDLAND UNITS 1 & 2	7220	1 OF 2	555

SITE	COORDINATES	ANGLE FROM HORIZ.	BEARING
CIRCULATING WATER INTAKE STRUCTURE	S 5074.37 E 721.26	90°	NA

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	HOLE SIZE	OVERBURDEN (FT.)	ROCK (FT.)	TOTAL DEPTH
5/9/83	5/16/83	LOUGHNEY DEWATERING	SPRAGUE-HENWOOD SKID RIG	4 1/2"	NA	NA	66.06'

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP OF CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
NA	NA	15	635.43	634.6	20.4'/614.2	NA

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
140 LBS./30 IN.	1/2" / 66.89'	D. HENDERSON / L. YOUNG

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE, LENGTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS "N" PERCENT CORE RECOVERY	PENETRATION BLOWS 1ST 6"	2ND 6"	3RD 6"	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							634.6	0			0-1.5' CONCRETE, PATIO COVER.	DRILLED THROUGH OPENING IN CONCRETE AT EL. 634.6.
											1.5-23.7' SPACE BETWEEN FLOORS	INSTALLED 6" STANDPIPE BETWEEN EL. 610.9 AND EL. 635.3.
								5				23.7-27.4' CORED USING 5- 1/8" O.D. CONCRETE CORE BARREL. GROUNDWATER STABILIZED AT EL. 614.28.
								10				27.4-66.06' HOLE ADVANCED BY DRIVING 4-1/2" O.D. CASING AND CLEANING OUT WITH A 3-1/8" TRICONE ROLLER BIT USING FRESH WATER.
								15				▽ 5/9/83
								20				
							610.9	23.7			23.7-26.9' CONCRETE, FOUNDATION SLAB	SAMPLES 1 THROUGH 4 USED 3" SPLIT SPOON SAMPLER AND DRIVEN WITH 315 lb. HAMMER TO OBTAIN SAMPLE RECOVERY.
								25				
							607.7	26.9			26.9-27.4' CONCRETE, MUDMAT	
							607.2	27.4				
3" SS	18"	6"	4	1	2	2	605.6	29		1	27.4-29.0' SAND, BROWN, FINE-TO MEDIUM-GRAINED, VERY LOOSE, WET, TRACE OF FINE GRAVEL. (SP)(FILL)	
							605.1	29.5			29.0-29.5' SILTY CLAY, GRAY-BROWN, MEDIUM PLASTICITY, SOFT, MOIST, TRACE OF FINE GRAVEL. (CL)(FILL)	SAMPLES 2 AND 3 HAD NO RECOVERY.
								30				
3" SS	18"	0"	22	8	9	13	599.6	35		2	29.5-46.3' SAND, BROWN, FINE-TO COARSE-GRAINED, WET, TRACE OF FINE GRAVEL. (SP)(FILL)	

FOR INFORMATION ONLY

SS-SPLIT SPOON; ST-SHELBY TUBE; D-DENNISON; P-PITCHER; O-OTHER

SITE: CIRCULATING WATER INTAKE STRUCTURE

HOLE NO. 555

BORING LOG

PROJECT: MIDLAND UNITS 1 & 2 | JOB NO. 7220 | SHEET NO. 2 of 2 | HOLE NO. 555

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE LENGTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS/ft PERCENT CORE RECOVERY	PENETRATION BLOWS PER 6"			ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							599.6	35				35.0-44.0' SOIL DESCRIPTION BASED ON DRILL CUTTINGS.
3" SS	18"	0"	27	15	13	14		40		3		
											FOR INFORMATION ONLY	
3" SS	18"	6"	74	64	39	35		45		4	44.0-46.5' SOME GRAVEL.	
							588.1	46.5				FILL
											46.5-63.8' SANDY SILT, GRAY, VERY DENSE, MOIST, TRACE OF FINE GRAVEL, TRACE OF CLAY. (ML)(TILL)	TILL
2" SS	18"	8"	166	48	65	101		50		5		
2" SS	18"	13"	198	65	83	115				6		SAMPLE 7 AND 8 HAD NO RECOVERY POSSIBLY PUSHING STONE OR COBBLE.
2" SS	18"	0"	616	128	263	353				7		
2" SS	18"	0"	412	102	158	254		55		8		
2" SS	18"	11"	245	63	90	155				9		52.0-55.5'; SANDY SILT SOIL DESCRIPTION BASED ON DRILL CUTTINGS.
2" SS	18"	13"	154	42	68	96				10		
2" SS	18"	18"	229	73	87	142				11		
2" SS	18"	14"	200	62	80	120		60		12		SAMPLE 10: TESTED FOR ATTERBERG LIMITS.
2" SS	18"	16"	146	48	68	78				13		
2" SS	18"	13"	184	31	43	141	570.8	63.8		14		
2" SS	18"	15"	221	70	93	128	570.3	64.3		15	63.8-64.3' ORGANIC SILTY CLAY, BLACK, VERY HARD, MEDIUM PLASTICITY, MOIST, SOME SAND. (OL)(TILL)	
							568.54	66.06			64.3-66.06' SANDY SILT, GRAY, VERY DENSE, MOIST, SEVERAL THIN (±1") SAND LAYERS, TRACE ANGULAR TO SUBANGULAR FINE GRAVEL, TRACE CLAY. (ML)(TILL)	DROVE 4" ID CASING TO EL. 568.54 AND WASHED CASING OUT FOR ONE HOUR WITH FRESH WATER.
											BOTTOM OF BORING AT 66.06' PIEZOMETER INSTALLED. SEE OBSERVATION WELL CONSTRUCTION SUMMARY.	

SS=SPLIT SPOON; ST=SHELBY TUBE; D=DENNISON; P=PITCHER; O=OTHER

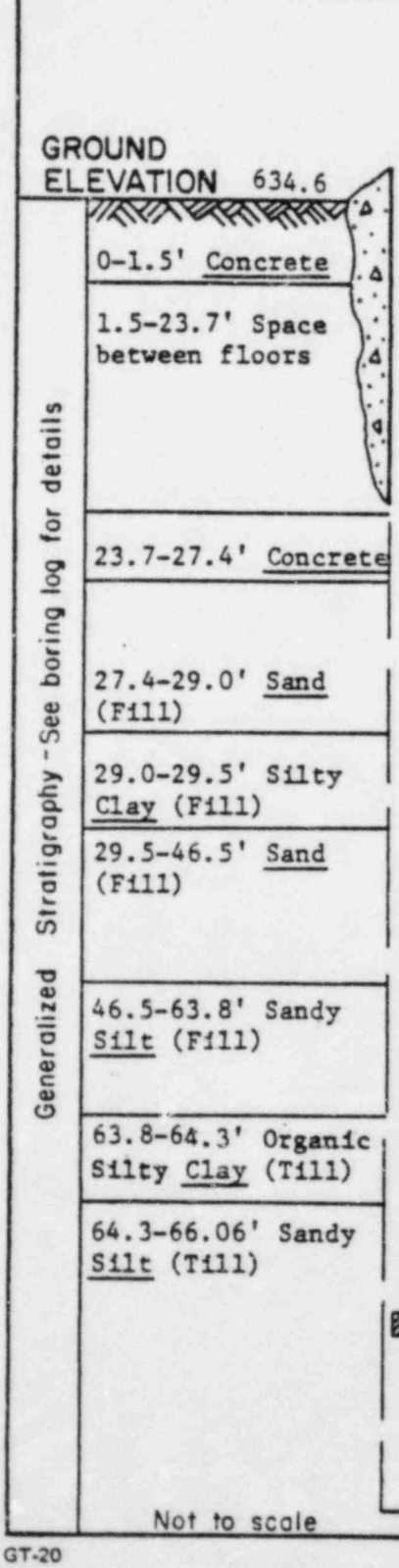
SITE: CIRCULATING WATER INTAKE STRUCTURE

HOLE NO. 555

OBSERVATION WELL CONSTRUCTION SUMMARY

PROJECT: Midland Units 1 & 2
SITE: Circulating Water Intake Structure
COORDINATES: S5074.37 E721.26
DATE COMPLETED: 6-1-83
SUPERVISED BY: D. Henderson

WELL NO. 555
AQUIFER Till



Elevation of reference point	635.43
Height of reference point above ground surface	.83'
Depth of surface seal (from El. 607.4)	21.4'
Type of surface seal: PGB Grout	
I. D. of surface casing	NA
Type of surface casing: NA	
Depth of surface casing	NA
I. D. of riser pipe	1/2"
Type of riser pipe: Schedule 80 PVC with threaded couplings	
Diameter of borehole	4 1/2"
Type of filler: NA	
Type of gravel pack Ottawa Flint Shot Sand	
Elev./depth of top of gravel pack	586.0/48.6'
Elevation/depth of top of screen	573.04/61.56
Description of screen #18 Commercially slotted PVC pipe	
I. D. of screen section	1/2"
Elevation / depth of bottom of screen	570.04/64.56'
Elev./depth of bottom of plugged blank section	568.54/66.06'
Elev./depth of bottom of gravel pack	568.54/66.06'
Type of filler below plugged section NA	
Elevation of bottom of borehole	568.54

GT-20

WELL INSTALLATION DATA SHEET

WELL NUMBER 555

PROJECT Midland Units 1 & 2 JOB NO. 7220-101 SUBCONTRACTOR Loughney Dewatering

COORDINATES S5074.37 E721.26 SURFACE ELEVATION 634.6

DATE STARTED 5-9-83 DATE COMPLETED 6-1-83 NO. OF SAMPLES 15

TYPE OF SAMPLES 2" Split Spoon/3" Split Spoon

DRILLING PROCEDURE

CASING DIAMETERS (IN)
O.D. 4 1/2"
I.D. 4"

DRILLING METHOD Rotary
HOLE DIAMETER 4 1/2" HOLE DEPTH 66.06'
SPECIAL CONDITIONS used 3" split spoon/315# hammer 27.9-45.7'.

WELL INSTALLATION

SCREEN SLOT SIZE .018" SCREEN DIAMETER 1/2" I.D. SCREEN LENGTH 3.0'
CENTRALIZERS: 63.73'

LENGTH OF BLANK BELOW SCREEN 1.5' LENGTH OF RISER ABOVE SCREEN 62.39'
LENGTH OF GRAVEL PACKED ZONE 17.4' CALCULATED AMOUNT OF GRAVEL PACK 1.86 cu.ft.
ACTUAL AMOUNT OF GRAVEL PACK 1.90 cu.ft.

THICKNESS OF SEAL 21.4'
TYPE OF SEAL PGB Grout CALCULATED AMOUNT OF SEAL 2.30 cu.ft.
ACTUAL AMOUNT OF SEAL 3.50 cu.ft. *more grout used than anticipated below structural floor mudmat.

WELL DEVELOPMENT

TYPE OF DEVELOPMENT NA
DEVELOPING TIME _____ AMOUNT OF MATERIAL REMOVED _____ (est)
SAND CONCENTRATION: (ppm by weight)
DURING DEVELOPMENT _____
FIRST RETEST _____
SECOND RETEST _____
THIRD RETEST _____

SPECIAL CONDITIONS Piezometer installed to monitor groundwater level in the Till and rising head test performed.

STATIC WATER LEVEL Elev. 605.75 DATE 6-6-83 EDUCTOR SETTING NA

SUBCONTRACTOR SUBMITTALS:

MICHIGAN DEWATERING WELL RECORD ☐

SUPERVISED BY
GEOLOGIST/HYDROGEOLOGIST L. Young

BORING LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
MIDLAND UNITS 1 & 2	7220	1 of 2	561

SITE	COORDINATES	ANGLE FROM HORIZ.	BEARING
SERVICE WATER PUMP STRUCTURE	S 5065.10 E 738.40	90°	NA

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	HOLE SIZE	OVERBURDEN (FT.)	ROCK (FT.)	TOTAL DEPTH
5/14/83	5/27/83	LOUGHNEY DEWATERING	ACKER SKID RIG	4 1/2"	NA	NA	50.1'

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP OF CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
NA	NA	17	621.90	620.0	4.3'/615.7	NA

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
140 LBS./30 IN.	1/2" / 52.0'	P.LARSEN/D.GOOD/J.GIVENS

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE LENGTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS 6" / PERCENT CORE RECOVERY	PENETRATION BLOWS 1ST 6"	2ND 6"	3RD 6"	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							620.0	0			0-3.1' CONCRETE, FOUNDATION SLAB.	INSTALLED 6" DIAMETER CASING AT TOP OF FLOOR TO CORE CONCRETE.
							616.9	3.1			3.1-3.8' CONCRETE, MUDMAT	
2' SS	18"	14"	14	6	5	9	616.2	3.8		1	3.8-33' SAND, BROWN, FINE-TO COARSE-GRAINED, MEDIUM DENSE TO DENSE, WET, TRACE OF SILT. (SP) (FILL)	▽ 5/14/83 0-3.8' CORED USING 3-7/8" O.D. CONCRETE CORE BARREL. GROUND-WATER LEVEL STABILIZED AT EL. 615.7 AFTER CORING THROUGH CONCRETE.
2' SS	18"	0"	48	5	20	28		10		2		THE 6" CASING WAS REMOVED DURING DRILLING OPERATIONS TO FACILITATE DRILLING.
2' SS	18"	4"	27	9	12	15		15		3		THE 4" I.D. CASING WAS ADVANCED USING 3 7/8" 4 WING CHOPPING BIT AND FRESH WATER.
2' SS	18"	7"	29	8 WH	13	16		20		4		*SAMPLE 4-RODS WERE DROPPED BY DRILLER 8'± ABOVE SOIL. EMBEDDED SPOON 5" INTO SOIL. TAPPED WITH HAMMER FOR LAST IN. OF FIRST 6".
2' SS	8" 23"	15.5'	SEE NOTE 1					25		5		*SAMPLE 5-5' OF 23" ADVANCE WAS IN CASING. ATTEMPTED TO CLEAN OUT W/SPOON 3 TIMES SINCE BORING COULD NOT BE WASHED OUT.
2' SS	18"	12"	56	17	27	29		30		6		1) BLOW COUNTS WERE 30-36-45 FOR AN N=81 HOWEVER HAMMER DROPPED ONLY 24" EQUIV. N FOR 30" DROP=65.
											33-3.7' CONCRETE, MUDMAT	FILL
							587.0	33				TILL
2' SS	14"	10"	SEE NOTE 2	22	23	12/2"	586.3 585.0	33.7 35		7	33.7-36.8' SANDY SILT, GRAY, VERY DENSE, WET, TRACE OF CLAY AND GRAVEL, (ML) (TILL)	

SS-SPLIT SPOON; ST-SHELBY TUBE; D-DENNISON; P-PITCHER; O-OTHER

SITE: SERVICE WATER PUMP STRUCTURE

HOLE NO. 561

BORING LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
MIDLAND UNITS 1 & 2	7220	2 of 2	561

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE LENGTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS / PERCENT CORE RECOVERY	PENETRATION BLOWS 1ST 6"	PENETRATION BLOWS 2ND 6"	PENETRATION BLOWS 3RD 6"	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
2" SS	18"	15"	99	29	49	50	585.0	35		8		A 3 7/8" PERCUSSION DRILL BIT WAS USED TO ADVANCE THE BORING THROUGH AN 8" CONCRETE MUDMAT AT EL. 587.0.
2" SS	18"	18"	114	49	50	64				9		
2" SS	18"	13"	108	33	44	62				10		
2" SS	18"	14"	116	35	50	66		40		11		
2" SS	18"	6"	267	36	92	175				12		2) SAMPLE 7 ONLY 14" ADVANCEMENT IN SOIL DUE TO PROCEDURAL LIMITATION AND 24" MAX. DRIVE. 10" WERE MISSING BECAUSE OF MUDMAT REMOVAL.
2" SS	18"	16"	130	50	50	80	577.0	43.0		13		
2" SS	18"	17"	143	42	62	81	576.8	43.2		14	43-43.2' SILTY SAND, GRAY, FINE TO MEDIUM GRAINED, VERY DENSE, WET. (SM)	
2" SS	18"	15"	143	40	66	75		45		15	43.2-50' SANDY SILT, GRAY, VERY DENSE, WET, TRACE OF CLAY AND GRAVEL. (ML) (TILL)	45.5-47.0' DROVE 3' SS AFTER 2' SS; ATTEMPT TO DRIVE CASING FAILED; DRILLED 45.5' TO 47'; ATTEMPT TO DRIVE CASING FAILED; TOOK 2' SS SAMPLE 47' TO 48.5'.
2" SS	18"	18"	161	28	67	94				16		
2" SS	18"	18"	143	40	58	85				17		48.5' TO 50' 2" SS SAMPLE DRILLED TO 50' (ELEV. 570) AND WASHED OUT THE BORE HOLE FOR ONE HOUR WITH FRESH WATER. AFTER WASHING RECORDED FINAL DEPTH OF 50.1'.
							569.9	50			BOTTOM OF BORING AT 50.1' PIEZOMETER WELL INSTALLED. SEE OBSERVATION WELL CONSTRUCTION SUMMARY.	

FOR INFORMATION ONLY

SS-SPLIT SPOON; ST-SHELBY TUBE; D-DENNISON; P-PITCHER; O-OTHER

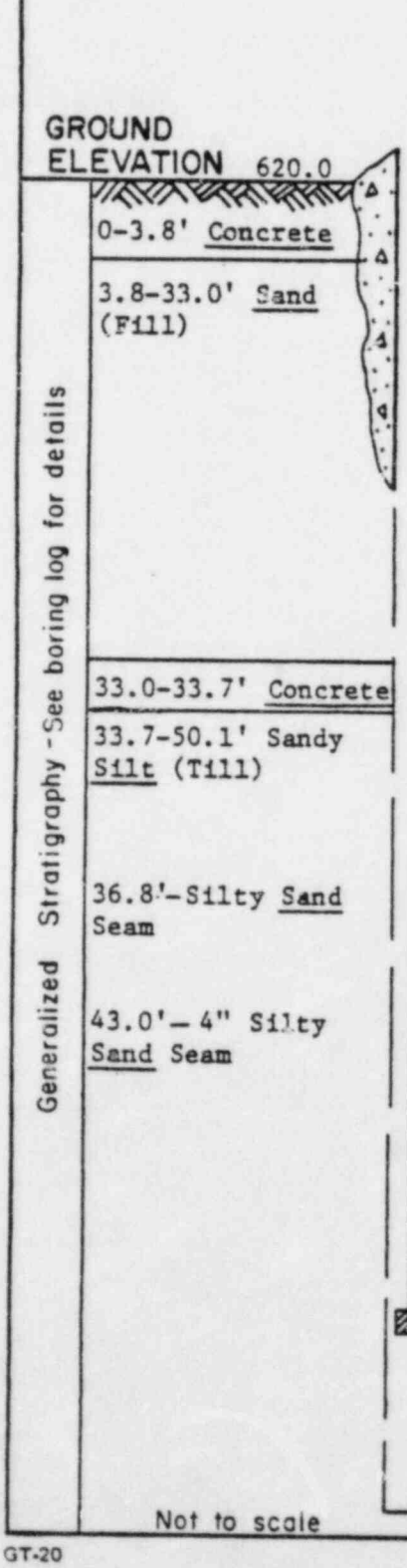
SITE: SERVICE WATER PUMP STRUCTURE

HOLE NO. 561

OBSERVATION WELL CONSTRUCTION SUMMARY

PROJECT Midland Units 1 & 2
SITE Service Water Pump Structure
COORDINATES S5065.10 E738.40
DATE COMPLETED 5-27-83
SUPERVISED BY D. Henderson

WELL NO. 501
AQUIFER Till



Elevation of reference point	621.90
Height of reference point above ground surface	1.9'
Depth of surface seal (from 3.1' below top of slab)	32.2'
Type of surface seal: PGB Grout	
I. D. of surface casing	NA
Type of surface casing: NA	
Depth of surface casing	NA
I. D. of riser pipe	1/2"
Type of riser pipe: Schedule 80 PVC with treaded couplings	
Diameter of borehole	4 1/2"
Type of filler: NA	
Type of gravel pack Ottawa Flint Shot Sand	
Elev./depth of top of gravel pack	584.7/35.3'
Elevation/depth of top of screen	574.4/45.6'
Description of screen #18 Commercially slotted scheduled 80 PVC pipe	
I. D. of screen section	1/2"
Elevation / depth of bottom of screen	571.4/48.6'
Elev./depth of bottom of plugged blank section	569.9/50.1'
Elev./depth of bottom of gravel pack	569.9/50.1'
Type of filler below plugged section NA	
Elevation of bottom of borehole	569.9

GT-20

WELL INSTALLATION DATA SHEET

WELL NUMBER 561

PROJECT Midland Units 1 & 2 JOB NO. 7220-101 SUBCONTRACTOR Loughney Dewatering Co.

COORDINATES S5065.10 E738.40 SURFACE ELEVATION 620.0

DATE STARTED 5-14-83 DATE COMPLETED 5-27-83 NO. OF SAMPLES 17

TYPE OF SAMPLES 2" Split Spoon/3" Split Spoon

DRILLING PROCEDURE

CASING DIAMETERS (IN)
O.D. 4 1/2"
I.D. 4"

DRILLING METHOD Rotary
HOLE DIAMETER 4 1/2" HOLE DEPTH 50.1'
SPECIAL CONDITIONS used 3" split spoon/315# hammer 45.5-47.0'

WELL INSTALLATION

SCREEN SLOT SIZE .018" SCREEN DIAMETER 1/2" SCREEN LENGTH 3.0'
CENTRALIZERS: 47.5'

LENGTH OF BLANK BELOW SCREEN 1.5' LENGTH OF RISER ABOVE SCREEN 47.5'
LENGTH OF GRAVEL PACKED ZONE 14.8' CALCULATED AMOUNT OF GRAVEL PACK 1.58 cu.ft.
ACTUAL AMOUNT OF GRAVEL PACK 1.24 cu.ft.

THICKNESS OF SEAL 32.2'
TYPE OF SEAL PGB Grout CALCULATED AMOUNT OF SEAL 3.46 cu.ft.
ACTUAL AMOUNT OF SEAL 7.91 cu.ft. *more grout used than anticipated below structural floor mudmat. Deep benchmark being drilled 14" away.

WELL DEVELOPMENT

TYPE OF DEVELOPMENT NA
DEVELOPING TIME AMOUNT OF MATERIAL REMOVED (est)
SAND CONCENTRATION: (ppm by weight)
DURING DEVELOPMENT
FIRST RETEST
SECOND RETEST
THIRD RETEST

SPECIAL CONDITIONS Piezometer installed to monitor groundwater level in the Till and rising head test performed.

STATIC WATER LEVEL 615.97 DATE 6-3-83 EDUCTOR SETTING NA

SUBCONTRACTOR SUBMITTALS:

MICHIGAN DEWATERING WELL RECORD ☐

SUPERVISED BY
GEOLOGIST/HYDROGEOLOGIST L. Young

BORING LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
MIDLAND UNITS 1 & 2	7220	1 of 2	567

SITE	COORDINATES	ANGLE FROM HORIZ.	BEARING
SERVICE WATER PUMP STRUCTURE	S 5053.47 E 755.11	90°	NA

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	HOLE SIZE	OVERBURDEN (FT.)	ROCK (FT.)	TOTAL DEPTH
5/2/83	5/7/83	Loughney Dewatering	Acker Skid Rig	4 1/2"	NA	NA	51.6'

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP OF CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
NA	NA	18	623.25	619.9	0.6'/619.3	NA

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
140 LBS./30 IN.	3" / 54.55'	D. Henderson / P. Larsen

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE LENGTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS/" PERCENT CORE RECOVERY	PENETRATION BLOWS 1ST 6"	PENETRATION BLOWS 2ND 6"	PENETRATION BLOWS 3RD 6"	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							619.9	0			0-3.0' CONCRETE, FOUNDATION SLAB.	▽ 5/2/83
								3				INSTALLED 6" DIAMETER CASING AT TOP OF FLOOR TO CORE CONCRETE. TOP OF 6" DIAMETER CASING AT EL. 623.25.
							616.9				3.0-3.5' CONCRETE, MUDMAT	
2" SS	18"	6"	3	0	0	3	616.0	3.9			3.9-5.0' SAND, BROWN, FINE-TO MEDIUM-GRAINED, VERY LOOSE, WET, TRACE OF GRAVEL. (CL)(FILL)	
							614.9	5		1		
							614.4	5.5			5.0-5.5'. SANDY CLAY, BROWN, MEDIUM-STIFF, MOIST, TRACE OF SILT, TRACE OF GRAVEL. (CL)(FILL)	
2" SS	18"	6"	13	5	5	8		10		2	5.5-34.0' SAND, BROWN, FINE-TO COARSE-GRAINED, WET, TRACE OF SILT. (SP)(FILL)	0-3.9' CORED USING 5-1/8" O.D. CONCRETE CORE BARREL. GROUND-WATER LEVEL STABILIZED AT EL. 619.3 AFTER CORING THROUGH CONCRETE.
											5.5-23.0' LOOSE TO MEDIUM DENSE	
2" SS	18"	2"	9	6	6	3		15		3		3.9-51.6' HOLE ADVANCED BY DRIVING 4 1/2" O.D. CASING AND CLEANING OUT WITH A 3-7/8" TRICONE ROLLER BIT USING FRESH WATER.
2" SS	18"	1"	29	22	16	13		20		4		
											23.0-34.0' VERY DENSE	
2" SS	18"	10"	102	33	44	58		25		5		4.0-5.0' SAMPLER ADVANCED UNDER WEIGHT OF 140 LB. HAMMER WITHOUT DRIVING
2" SS	18"	3"	94	36	45	49		30		6		
												FILL TILL
2" SS	18"	16"	128	39	44	84	585.9	34		7	34.0-35.5' SILTY CLAY, GRAY, LOW PLASTICITY, HARD, MOIST, SOME SAND, TRACE OF FINE GRAVEL. (CL)(TILL)	
							584.9	35				

SS=SPLIT SPOON; ST=SHELBY TUBE; D=DENNISON; P=PITCHER; O=OTHER

SITE: SERVICE WATER PUMP STRUCTURE

HOLE NO. 567

BORING LOG

PROJECT: MIDLAND UNITS 1 & 2 | JOB NO. 7220 | SHEET NO. 2 of 2 | HOLE NO. 567

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE LENGTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS "N" PERCENT CORE RECOVERY	PENETRATION BLOWS 1ST 6"	2ND 6"	3RD 6"	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							584.9	35				
2" SS	18"	15"	140	37	50	90	584.4	35.5			35.5-36.0' SILTY SAND, GRAY, FINE-TO MEDIUM-GRAINED, VERY DENSE, WET, TRACE OF FINE GRAVEL. (SM)(TILL)	
							584.1	36		8		
							583.6	36.5				
							582.9	37		9	36.0-36.5' SILTY CLAY, GRAY, HARD, MOIST, SOME SAND, TRACE OF FINE GRAVEL. (CL)(TILL)	SAMPLE 9: TESTED FOR ATTERBERG LIMITS.
2" SS	18"	18"	113	38	43	70				10		
2" SS	18"	18"	108	25	43	65		40		11	36.5-37.0' SILTY SAND, GRAY, FINE-TO MEDIUM-GRAINED, VERY DENSE, WET, TRACE OF FINE GRAVEL. (SM)(TILL)	
2" SS	18"	18"	200	40	70	130				12		
2" SS	18"	18"	150	39	60	90				13		
2" SS	18"	18"	310	42	110	200				14	37.0-49.6' SANDY SILT, GRAY, VERY DENSE, MOIST, TRACE OF CLAY, TRACE OF FINE GRAVEL. (ML)(TILL)	
2" SS	18"	18"	237	63	77	160		45		15		
2" SS	18"	18"	194	78	74	120				16		
2" SS	18"	18"	125	49	54	71						
2" SS	13.5	13"	325+	53	125	200/1.5"	570.3	49.6		17	49.5-49.6' BLACK ORGANIC CLAY SEAM.	DROVE 4" I.D. CASING TO EL. 568.3 AND WASHED CASING OUT FOR ONE HOUR WITH FRESH WATER.
							569.6	50				
2" SS	18"	18"	138	35	62	76	569.8	50.1		18	49.6-50.1' SILTY SAND, GRAY, FINE-GRAINED, VERY DENSE, MOIST. (SM)(TILL)	
							568.3	51.6			50.1-51.6' SANDY SILT, GRAY, VERY DENSE, MOIST, TRACE OF FINE GRAVEL. (ML)(TILL)	
											BOTTOM OF BORING AT 51.6	
											DEWATERING WELL INSTALLED-SEE PUMPING WELL CONSTRUCTION SUMMARY.	

SS=SPLIT SPOON; ST=SHELBY TUBE; D=DENNISON; P=PITCHER; O=OTHER

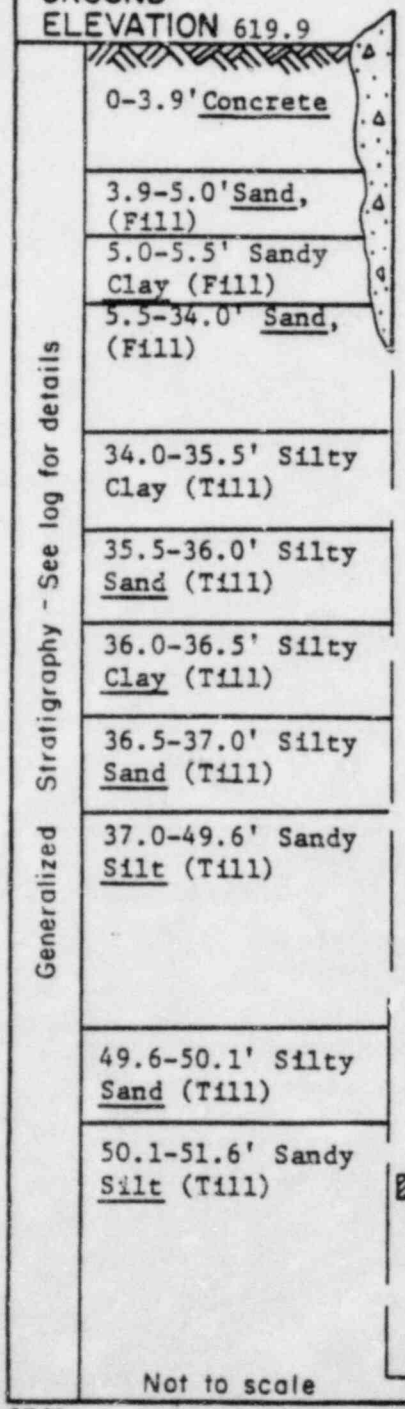
SITE: SERVICE WATER PUMP STRUCTURE

HOLE NO. 567

PUMPING WELL CONSTRUCTION SUMMARY

PROJECT Midland Units 1 & 2
SITE Service Water Pump Structure
COORDINATES S5053.47 E755.11
DATE COMPLETED 5/7/83
SUPERVISED BY D. Henderson

WELL NO. 567
AQUIFER Backfill Sand and Till



Elevation of reference point	623.25
Height of reference point above ground surface	3.35'
Depth of surface seal	NA
Type of surface seal:	NA
I. D. of surface casing	NA
Type of surface casing:	NA
Depth of surface casing	NA
I. D. of riser pipe	3"
Type of riser pipe:	galvanized steel pipe
Diameter of borehole	4 1/2"
Type of filler:	NA
Type of gravel pack	Ottawa Flint Shot Sand
Elev./depth of top of gravel pack	619.9/0'
Elevation/depth of top of screen	614.8/5.1'
Description of screen	#8 continuously slotted wire wound galvanized low carbon steel
I. D. of screen section	3"
Elevation/depth of bottom of screen	568.7/51.2'
Elev./depth of bottom of plugged blank section	NA
Elev./depth of bottom of gravel pack	568.7/51.2'
Type of filler below plugged section	0.4' Fine-grained material settled out of suspension
Elevation of bottom of borehole	568.3

GT-79

WELL INSTALLATION DATA SHEET

WELL NUMBER 567

PROJECT Midland Units 1 & 2 JOB NO. 7220-101 SUBCONTRACTOR Loughney Dewatering Co.

COORDINATES S5053.47 E755.11 SURFACE ELEVATION 619.9

DATE STARTED 5-2-83 DATE COMPLETED 5-7-83 NO. OF SAMPLES 18

TYPE OF SAMPLES 2" split spoon

DRILLING PROCEDURE

CASING DIAMETERS (IN)
O.D. 4 1/2"
I.D. 4"

DRILLING METHOD Rotary
HOLE DIAMETER 4 1/2" HOLE DEPTH 51.6'
SPECIAL CONDITIONS -

WELL INSTALLATION

SCREEN SLOT SIZE 0.008" SCREEN DIAMETER 3 1/2" O.D. SCREEN LENGTH 46.1'
CENTRALIZERS: NA

LENGTH OF BLANK BELOW SCREEN N A LENGTH OF RISER ABOVE SCREEN 8.5'
LENGTH OF GRAVEL PACKED ZONE 51.2' CALCULATED AMOUNT OF GRAVEL PACK 2.26 cu. ft.
ACTUAL AMOUNT OF GRAVEL PACK 2.37 cu. ft.

THICKNESS OF SEAL NA
TYPE OF SEAL NA CALCULATED AMOUNT OF SEAL NA
ACTUAL AMOUNT OF SEAL NA

WELL DEVELOPMENT

TYPE OF DEVELOPMENT NA
DEVELOPING TIME _____ AMOUNT OF MATERIAL REMOVED _____ (est)
SAND CONCENTRATION: (ppm by weight)
DURING DEVELOPMENT _____
FIRST RETEST _____
SECOND RETEST _____
THIRD RETEST _____

SPECIAL CONDITIONS Construction dewatering well installed.

STATIC WATER LEVEL Elev. 619.3 DATE 5-7-83 EDUCTOR SETTING NA

SUBCONTRACTOR SUBMITTALS:

MICHIGAN DEWATERING WELL RECORD ☐

SUPERVISED BY
GEOLOGIST/HYDROGEOLOGIST L.E. Young

BORING LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
MIDLAND UNITS 1 & 2	7220	1 of 2	576

SITE	COORDINATES	ANGLE FROM HORIZ.	BEARING
SERVICE WATER PUMP STRUCTURE	S 5032.14 E 781.77	90°	NA

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	HOLE SIZE	OVERBURDEN (FT.)	ROCK (FT.)	TOTAL DEPTH
5/2/83	5/11/83	LOUGHNEY DEWATERING	CME 45	4 1/2"	NA	NA	51.0'

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP OF CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
NA	NA	17	621.25	619.9	1.17'/618.73	NA

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
140 LBS./30 IN.	1/2" / 51.85'	L.E. YOUNG / D. KOSCO

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE LENGTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS per 6" / PERCENT CORE RECOVERY	PENETRATION BLOWS 1ST 6"	2ND 6"	3RD 6"	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							619.9	0			0-3.4' CONCRETE, FOUNDATION SLAB.	▽ 5/11/83
							616.5	3.4			3.4-4.0' CONCRETE, MUDMAT.	INSTALLED 6" DIA. CASING AT TOP OF FLOOR TO CORE CONCRETE. TOP OF 6" DIA. CASING AT EL. 621.25.
							615.9	4			4.0-5.5' SAND, BROWN, FINE-TO COARSE-GRAINED, LOOSE, WET. (SP)(FILL)	
2" SS	18"	9"	12	4	5	7	614.4	5		1		
							613.8	5.5			5.5-6.1' SILTY CLAY, BROWN, MEDIUM STIFF LOW PLASTICITY, TRACE SAND. (CL)(FILL)	
								6.1			6.1-34.5' SAND, BROWN, FINE-TO COARSE-GRAINED, LOOSE, WET, SOME FINE GRAVEL, AND TRACE OF CLAY. (SP)(FILL)	0-4.0' CORED USING 5-⅛" O.D. CONCRETE CORE BARREL GROUND-WATER LEVEL STABILIZED AT EL. 619.3 AFTER CORING THROUGH CONCRETE.
2" SS	18"	6"	9	6	5	4		10		2		
2" SS	18"	6"	3	3	2	1		15		3		4.0-34.5' HOLE ADVANCED BY DRIVING 4-½" O.D. CASING AND CLEANING OUT WITH A 3-⅞" TRI-CONE ROLLER BIT USING FRESH WATER
2" SS	18"	3"	13	10	6	7		20		4		
2" SS	18"	9"	90	21	28	62		25		5	24.5-34.5' VERY DENSE	
2" SS	18"	8"	104	33	52	52		30		6		34.5-51.0' HOLE ADVANCED BY DRIVING 4-½" O.D CASING AND CLEANING OUT WITH A 3-½" O.D. DRAG BIT USING FRESH WATER.
							585.4	34.5				FILL
							584.9	35				TILL

FOR INFORMATION ONLY

SS-SPLIT SPOON; ST-SHELBY TUBE; D-DENNISON; P-PITCHER; O-OTHER

SITE: SERVICE WATER PUMP STRUCTURE

HOLE NO. 576

BORING LOG

PROJECT: MIDLAND UNITS 1 & 2 | JOB NO. 7220 | SHEET NO. 2 of 2 | HOLE NO. 576

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE LENGTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS / PERCENT CORE RECOVERY	PENETRATION BLOWS 1ST 6"	2ND 6"	3RD 6"	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							584.9	35				
2" SS	18"	18"	180	27	75	105				7	34.5-37.5' SILTY CLAY, GRAY, HARD, DRY, TRACE TO SOME FINE-GRAINED SAND OCCURING IN THIN (1/4") LAYERS, TRACE FINE GRAVEL AND COBBLES. (CL) (TILL)	
2" SS	18"	18"	152	54	75	77				8		
							582.4	37.5				
2" SS	18"	17"	195	46	90	105				9	37.5-42.3' SANDY SILT, GRAY, VERY DENSE, DRY, TRACE TO SOME CLAY, TRACE FINE GRAVEL AND COBBLES. SAND OCCURS BOTH IN THIN STRINGERS AND INTER-MIXED WITH SILT. (ML) (TILL)	
2" SS	18"	18"	133	43	45	88		40		10		SAMPLE 10: TESTED FOR ATTERBERG LIMITS.
2" SS	18"	18"	200	47	83	117				11		
							577.6	42.3				
2" SS	18"	15"	169	100	80	89				12	42.3-43.5' SILTY SAND, GRAY, FINE-TO MEDIUM-GRAINED, VERY DENSE, WET, TRACE CLAY. (SM) (TILL)	
							576.4	43.5				
2" SS	18"	18"	113	30	44	69	575.8	44.05		13	43.5-43.8' SANDY SILT, GRAY, VERY DENSE, DRY, TRACE CLAY. (ML) (TILL)	
2" SS	18"	18"	122	43	58	64		45		14		
							573.4	46.5			43.8-44.05' SILTY SAND, GRAY, FINE-TO MEDIUM-GRAINED, VERY DENSE, WET, TRACE CLAY. (SM) (TILL)	50.5' DRIVING COBBLE. DROVE 4"I.D. CASING TO EL. 568.9 AND WASHED CASING OUT FOR ONE HOUR WITH FRESH WATER
2" SS	18"	18"	83	37	36	47	572.4	47.5		15		
							572.2	47.7				
2" SS	18"	18"	145	50	64	81				16	44.05-46.5' SILT, GRAY, VERY DENSE, DRY, SOME FINE-GRAINED SAND, TRACE CLAY. (ML) (TILL)	
2" SS	18"	18"	161	45	55	106		50		17		
							568.9	51			46.5-47.5' SANDY SILT, GRAY, VERY DENSE, DRY, VERY FINE-GRAINED SAND, TRACE SUBANGULAR TO ANGULAR FINE GRAVEL, TRACE CLAY. COBBLE AT TOP OF SAMPLE. (ML) (TILL)	
											47.5-47.71' SILTY SAND, GRAY, VERY FINE-TO FINE-GRAINED, VERY DENSE, MOIST, TRACE CLAY. (SM) (TILL)	
											47.71-51.0' CLAYEY SILT, GRAY, VERY DENSE, DRY, SOME VERY FINE-GRAINED SAND, TRACE SUBANGULAR TO ANGULAR FINE GRAVEL. (ML) (TILL)	
											BOTTOM OF BORING AT 51.0' PIEZOMETER INSTALLED. SEE OBSERVATION WELL CONSTRUCTION SUMMARY.	

FOR INFORMATION ONLY

SS-SPLIT SPOON; ST-SHELBY TUBE; D-DENNISON; P-PITCHER; O-OTHER

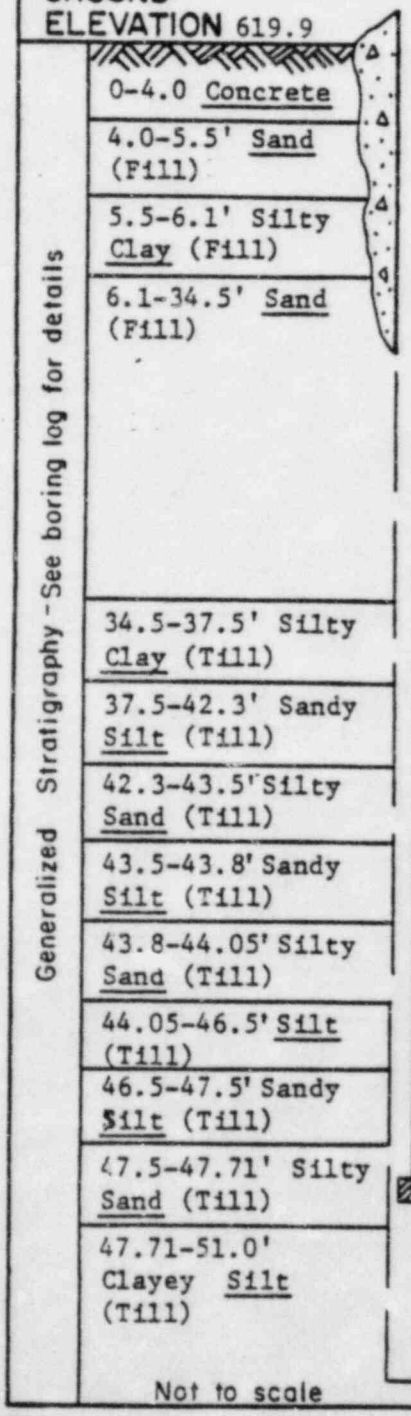
SITE: SERVICE WATER PUMP STRUCTURE

HOLE NO. 576

OBSERVATION WELL CONSTRUCTION SUMMARY

PROJECT: Midland Units 1 & 2
SITE: Service Water Pump Structure
COORDINATES: S5032.14 E781.77
DATE COMPLETED: 5-27-83
SUPERVISED BY: L. Young

WELL NO. 576
AQUIFER Till



Generalized Stratigraphy - See boring log for details

Elevation of reference point	621.25
Height of reference point above ground surface	1.35'
Depth of surface seal (from 3.05' below top of slab)	33.85'
Type of surface seal: PGB grout	
I. D. of surface casing	NA
Type of surface casing: NA	
Depth of surface casing	NA
I. D. of riser pipe	1/2"
Type of riser pipe: Schedule 80 PVC with threaded couplings	
Diameter of borehole	4 1/2"
Type of filler: NA	
Type of gravel pack Ottawa Flint Shot Sand	
Elev./depth of top of gravel pack	583.0/36.9'
Elevation/depth of top of screen	572.4/47.5'
Description of screen #18 commercially slotted schedule 80 PVC pipe	
I. D. of screen section	1/2"
Elevation / depth of bottom of screen	569.4/50.5'
Elev./depth of bottom of plugged blank section	NA
Elev./depth of bottom of gravel pack	568.9/51.0'
Type of filler below plugged section Ottawa Flint Shot Sand	
Elevation of bottom of borehole	568.9

GT-20

WELL INSTALLATION DATA SHEET

WELL NUMBER 576

ROJECT Midland Units 1 & 2 JOB NO. 7220-101 SUBCONTRACTOR Loughney Dewatering Co.

OORDINATES S5032.14 E781.77 SURFACE ELEVATION 619.9

ATE STARTED 5-2-83 DATE COMPLETED 5-27-83 NO. OF SAMPLES 17

YPE OF SAMPLES 2" Split Spoon

DRILLING PROCEDURE

ASING DIAMETERS (IN)
O.D. 4 1/2"
I.D. 4"

DRILLING METHOD Rotary
HOLE DIAMETER 4 1/2" HOLE DEPTH 51.0'
SPECIAL CONDITIONS

WELL INSTALLATION

CREEN SLOT SIZE 0.018" SCREEN DIAMETER 1/2" SCREEN LENGTH 3.0'
ENTRALIZERS: 49.6'

ENGTH OF BLANK BELOW SCREEN NA LENGTH OF RISER ABOVE SCREEN 38.25'
ENGTH OF GRAVEL PACKED ZONE 14.2' CALCULATED AMOUNT OF GRAVEL PACK 1.52 cu.ft.
CTUAL AMOUNT OF GRAVEL PACK 1.75 cu.ft.

THICKNESS OF SEAL 33.85'
YPE OF SEAL PGB Grout CALCULATED AMOUNT OF SEAL 3.63 cu.ft.
CTUAL AMOUNT OF SEAL 4.89 cu.ft. *More grout used than anticipated below structural floor mudmat.

WELL DEVELOPMENT

YPE OF DEVELOPMENT NA
EVELOPING TIME AMOUNT OF MATERIAL REMOVED (est)
AND CONCENTRATION: (ppm by weight)
URING DEVELOPMENT
IRST RETEST
ECOND RETEST
HIRD RETEST

SPECIAL CONDITIONS Piezometer installed to monitor groundwater level in the Till and rising head test performed.

TATIC WATER LEVEL Elev. 618.72 DATE 5-27-83 EDUCTOR SETTING NA

UBCONTRACTOR SUBMITTALS:

ICHIGAN DEWATERING WELL RECORD ☐

SUPERVISED BY
GEOLOGIST/HYDROGEOLOGIST L. Young

SWPS PIEZOMETER AND WELL GRAVEL PACK

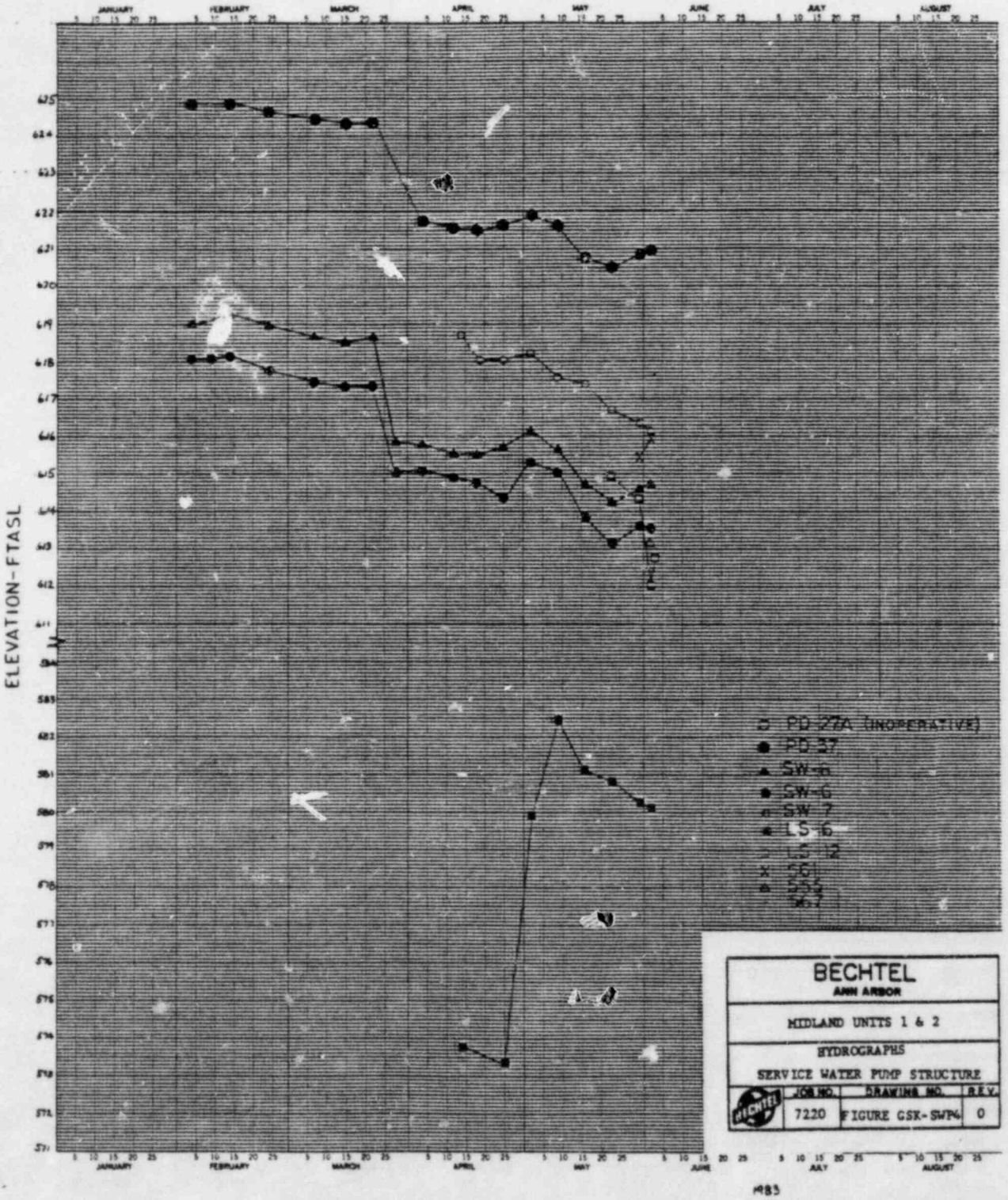
AND GROUT VOLUME COMPARISON SUMMARY

Well No.	Gravel Pack			Grout			Total Hole		
	Calc cu. ft.	Act cu. ft.	% Diff.	Calc cu. ft.	Act cu. ft.	% Diff.	Calc cu. ft.	Act cu. ft.	% Diff.
LS-6	3.81	2.56	-32.8	8.47	10.15	+19.8	12.28	12.71	+3.5
LS-12	1.51	1.54	+2.0	3.55	4.40	+23.9	5.06	5.94	+17.4
555	1.86	1.90	+2.2	2.30	3.50	+52.2[2]	4.16	5.40	+29.8[2]
561	1.58	1.24	-21.5	3.46	7.91	+128.6[2]	5.04	9.15	+81.5[2]
567	2.26	2.37	+4.9	NA	NA	NA	2.26	2.37	+4.9
576	1.52	1.75	+15.1	3.63	4.89	+34.7[2]	5.15	6.64	+28.9[2]

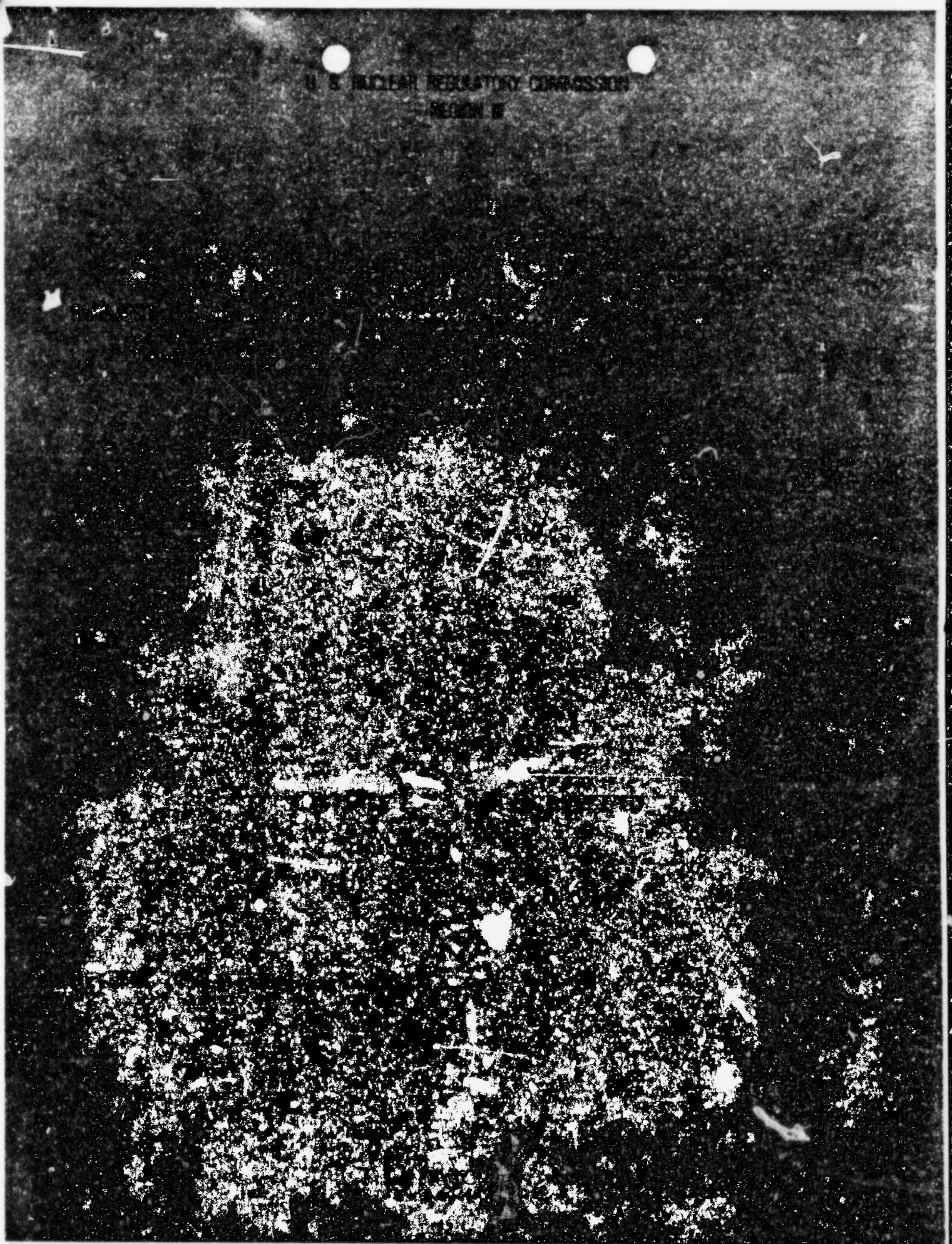
[1]Should be ≤ 25%

[2]Excessive grout used at top of hole due to very loose soils immediately beneath the structural floor mudmat.

C3060701



BECHTEL ANN ARBOR			
MIDLAND UNITS 1 & 2			
HYDROGRAPHS			
SERVICE WATER PUMP STRUCTURE			
	JOB NO.	DRAWING NO.	REV.
	7220	FIGURE GSK-SWP4	0


U. S. NUCLEAR REGULATORY COMMISSION
REGION II

Chron

CONSUMERS POWER COMPANY

James W Cook
Vice President - Projects, Engineering and Construction

General Offices: 1945 West Parnall Road, Jackson, MI 49201 • (517) 788-0453

April 22, 1983

PRINCIPAL STAFF
NRR Mas
1 orig + 3
FILE Mas

Mr J G Keppler, Administrator, Region III
Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

MIDLAND NUCLEAR COGENERATION PLANT -
MIDLAND DOCKET NO's 50-329, 50-330 -
CONSTRUCTION COMPLETION PROGRAM
FILE 0655, B1.1.7 SERIAL 22027

REFERENCES 1. LETTER TO MR J W COOK DATED MARCH 28, 1983 FROM MR J G KEPPLER REGARDING CONSTRUCTION COMPLETION PROGRAM

2. LETTER FROM MR J W COOK DATED APRIL 6, 1983 TO MR J G KEPPLER REGARDING CONSTRUCTION COMPLETION PROGRAM THIRD PARTY OVERVIEW

Your letter of March 28, 1983 regarding the Construction Completion Program (CCP) consisted of Parts A, B and C. My letter of April 6, 1983 to you replied to items A5, all of Part B, all of Part C and to Enclosure 1, the Protocol document for the Independent Design Verification. At the April 13, 1983 meeting in Bethesda on Independent Design Verification (IDV), we provided additional discussion and clarification of the communications between the parties during the IDV.

The enclosure to this letter provides responses to items A1, 2, 3, 4, 6, 7, 8 and 9 of your letter of March 28, 1983.

Based upon this letter and my April 6, 1983 letter, we believe that complete responses have now been provided to your March 28, 1983 letter.

James W. Cook

APR 25 1983

oc0483-0426a100

1710.

~~8304210211~~

JWC/GSK/bjb

CC Atomic Safety and Licensing Appeal Board (w/o att)
CBechhoefer (w/o att)
FPCowan, ASLB (w/o att)
JHarbour, ASLB (w/o att)
MMCherry (w/o att)
FSKelley (w/o att)
HRDenton, NRC (w/att)
WHMarshall (w/o att)
WDPaton, NRC (w/o att)
BStamiris (w/o att)
MSinclair (w/o att)
LLBishop (w/o att)

oc0483-0426a100

Response To NRC Questions On
Construction Completion Program

QUESTION A1

"1. Because of problems identified by the NRC during the special inspection of the diesel generator building and because similar problems were found in other areas of the plant during subsequent inspections by CPCo, we believe that 100% reinspection of accessible safety related structures, systems and components is warranted. Should you intend doing less than 100% reinspection, please provide the details of your proposed program and the technical rationale for accepting a sampling approach."

RESPONSE

Consumers Power Company has developed two major programs already committed to in addition to the Quality Verification Plan (included in the CCP). These two programs include the following 100% verification efforts:

A. Verification of approximately 13,500 closed Inspection Reports through reinspection of approximately 7,000 piping supports and restraints.

B. Reinspection of accessible attributes of approximately 9,000 1-E cables installed to PQCI E-4.0 including cable routing and identification.

The Quality Verification Plan includes the following 100% reinspections:

A. All closed Inspection Reports (IR) that contain In-Process Inspection Notices (IPINs). This involves approximately 4,300 IRs.

B. All closed IRs that contain Deficiency Reports (DR). This includes approximately 4,500 IRs.

C. All closed IRs associated with specific PQCI which have less than 100 IRs.

In addition, the Quality Verification Program also requires that 100% inspection of the remaining PQCIs will be initiated and continued until it has been demonstrated with 95% confidence that 95% of the inspectable elements meet quality requirements. Upon demonstration of the 95% quality level, Consumers Power Company will reconsider the basis on which to continue the verification effort for the remaining population of each PQCI. This may include the statistical sampling techniques as noted below.

Exceptions to the plan may be taken in those cases where other means of verifying quality have been demonstrated as described in the plan details below.

Quality Verification Program Description

Consumers Power Company has prepared a Quality Verification Program to confirm the quality status of safety-related equipment and construction activities completed and inspected by the Engineer/Quality Control personnel prior to December 2, 1982.

The program will cover all closed Inspection Records of inspections performed prior to December 2, 1982, except:

A. Remedial Soils Work which has been under the direction of Consumers Power Company quality personnel since it began.

B. HVAC work which has been under the direction of Consumers Power Company QA personnel since the major reorganization in June 1981.

C. Verification of 1-E cable routing and identification and verification of ASME hangers which are being performed under separate reinspection programs as noted previously.

D. B&W Construction Company activities which have been performed under B&W Quality Assurance Programs.

The quality verification program will address safety related equipment, systems and structures in which the prior 100% inspections have been performed and completed under the direct supervision of the Engineer/Constructor. Such inspections were performed in accordance with approximately 100 Project Quality Control Instructions (PQCIs) that specified the inspection requirements to be achieved by quality control personnel. The program will include PQCIs for which no other verification activity has taken place or is scheduled to take place. There are closed IRs for approximately 139,000 primary inspections. Closed IRs are those where the Engineer/Constructor has completed a 100% inspection of installed hardware. Where a reinspection has occurred on a specific commodity, the latest IR will be addressed.

This program will assess the validity of prior inspections and provide assurance of the quality of completed work. To accomplish this, accessible attributes of items covered by completed IRs will be reinspected. For inaccessible attributes, the original inspection documents will be reviewed for evidence of acceptability and additional justification will be developed as required to support the validity of inspections associated with such PQCIs. Each IR relates to a specific PQCI. PQCIs are organized by discipline and further structured to activities within that discipline, eg, there are separate PQCIs and corresponding IRs for preplacement, placement and post-placement inspections of concrete. Closed Inspection Records related to each PQCI provide a population of like activities.

To assess the validity of these past completed inspections, Consumers Power Company will reinspect on a 100% basis, the accessible attributes of all populations where the quantity of closed IRs is less than one hundred. In addition, where the population of closed IRs for a specific PQCI is more than 100, Consumers Power Company will reinspect on a one hundred percent basis a

sufficient number of items to establish a quality baseline and predict with 95% confidence that the quality level is in excess of 95% for the specific PQCIs. Consumers Power Company will then make a determination as to whether further verification of specific PQCI populations can be conducted by a statistical sampling plan. This sampling approach, which is based on a nationally accepted standard and is consistent with past NRC recommendations related to reinspections of safety-related items, is fully described in the Quality Verification Program. The NRC Resident Inspection staff will be informed of such a determination before implementation of a sampling effort.

Any nonconforming condition observed during the implementation of this program other than those previously identified on nonconformance reports, will be identified by a nonconformance report and will be dispositioned in accordance with approved procedures.

Reinspections will be conducted in accordance with PQCIs which have been reviewed-revised since implementation of the Construction Completion Program (CCP) and in accordance with current design drawings and specifications. An acceptable reinspection will validate the installed hardware and, for the purposes of the program will validate the prior IR. If an apparent deficiency exists between the as built condition of the item and the referenced design drawing or specification, a further check will be made to determine the design basis against which the original IR was completed. This check as well as the current stage of construction will allow a determination to be made as to whether a nonconformance of "as built vs design" exists.

Documentation of deficiencies will be noted on the newly initiated IR, entered on a nonconformance report and will be cross referenced to the original IR.

Program elements that differ from that described above will be created as follows:

1. Exceptions to this program may be taken where objective evidence is available of a CPCo overinspection of the Engineer/Constructor's inspections and where such overinspection demonstrates effective quality control and provides the basis to verify acceptability of the items or attributes covered by past IRs and validate the original inspection with minimal or no further reinspection or review. Where such exceptions are proposed to be taken, a special report will be prepared by the MPQAD-QA Superintendent for review and approval of the Executive Manager-MPQAD. This report will contain full justification for the exception. The Executive Manager-MPQAD will inform the NRC Resident Inspection staff whenever he has made a decision to allow such a exception to the program prior to implementing the exception.

2. There are 55 PQCIs which cover activities that are inaccessible for reinspection. These include rebar installation, placed concrete, containment building tendon reinspection, and PQCIs relating to surveillance of subcontractor actions. Documentation relating to these PQCIs will be reviewed as indicated in this program. These PQCIs, either individually or by groups, will be reviewed and

justification will be developed by a document review to support the validity of completed inspections associated with these PQCIs. This justification or recommendation for additional verification activites, will be provided by the MPQAD-QA Superintendent to the Executive Manager-MPQAD for decision and approval.

3. The Executive Manager may group special populations of PQCIs or IRs that may be treated as a unique population provided all other elements of this program are applied to this unique population.

Reports And Documentation

Results of reinspections and document reviews will be recorded on IRs opened specifically for this pupose. Each such IR will cross-reference to the existing IR. A notation will be made on the new IR to identify whether the existing original inspection covered by the IR was validated, rejected or is indeterminate. The new IR will provide the basis to document the quality status of the items or attributes being reinspected.

A weekly written report will be made jointly by the MPQAD QC and QA Superintendents to the Executive Manager of MPQAD summarizing the results of the program. The Executive Manager will inform the CPCo Site Manager, the Vice President, Projects Engineering and Construction and the Engineer/Constructor Project Manager of the status of the Quality Verification Program on a biweekly basis. The Executive Manager-MPQAD will provide a monthly report of Quality Verification Program results to the CPCo Site Manager and Vice President, Projects Engineering and Construction and the Engineer/Constructor Project Manager. This report will be made available to the Construction Implementation Overviewer and the NRC.

The Executive Manager-MPQAD will have total overall responsibility and authority for the development and implementation of all quality related aspects of this verification program which will be solely under the direction of MPQAD.

QUESTION A2

"2. A description of the reinspection program for accessible systems and components important to safety."

RESPONSE

The Midland Nuclear Plant has been designed and constructed with a two level philosophy of quality classification. Those structures, systems or components which are safety related (such as those identified in Regulatory Guide 1.29, Section C.1, as modified by the Midland FSAR) are designated "Q". All other structures, systems, and components are designated "Non-Q".

Items that are considered important to safety, but that are not classified as "Q" are being addressed by a separate program. This program was developed to address the generic safety task A-17 "System Interaction," and was described in a letter, J W Cook to H R Denton dated January 28, 1983. This Systems Interaction Program will provide assurance that equipment important to safety, because of its potential interaction with safety related (Q) equipment, has been evaluated to ensure that such equipment will not compromise the capability of safety systems to perform their intended functions. The protection of the safety-related systems is part of the design process. In the installation of these systems coupled with the field routing of certain commodities, however, it is possible that new items become important to safety. To this end the Systems Interaction Program describes a comprehensive effort which includes an integrated series of walkdowns to identify potential interactions. The evaluation of these potential interactions will assure that equipment important to safety has been identified, and that its potential for degrading the performance of safety systems has been resolved.

The seismic II/I and proximity walkdown, which forms an important part of the Systems Interaction Program, is being conducted in part by the Engineer/Constructor and in part by the consultant who performed this work for other sites. This inspection is separate from the CCP, but it is being integrated into CCP activities for purposes of scheduling the availability of uncongested areas, areas that are sufficiently complete to warrant inspection and the use of inspection aids such as scaffolding.

Three additional walkdowns identified in the Systems Interaction Program are HELBA, missiles and flooding. These walkdowns serve to further increase our confidence that the primary walkdowns are effective with respect to identifying equipment important to safety. These walkdowns are performed by individuals with perspectives different from the proximity and Seismic II/I walkdown teams. All of these walkdowns are expected to occur in 1983 and early 1984.

The design engineering process, the construction process and the Systems Interaction Program form a multi-layered approach to assuring that systems important to safety will not inhibit safety systems from performing their intended function. Once the plant is complete and turned over to Nuclear Operations Department, equipment important to safety is addressed by Nuclear Operations Department Standards A21 and the QA Topical Report CPC-2A. This

list starts with the construction Q list then adds structures, systems components and chemicals considered important to safety via a detailed review of the equipment data base. Items placed on the operations Q list are then subject to applicable elements of the QA program from then on regardless whether they are safety-related or important to safety.

QUESTION A3

"3. A description of the measures you intend to institute to assure that QC reinspection will be sufficiently independent of team controls."

RESPONSE

The QC reinspection effort is independent of team controls although work schedules will be coordinated on a team level. This independence is maintained as follows:

Quality Verification Plan

This effort is solely under the responsibility of MPQAD to plan, implement and evaluate results. MPQAD personnel will coordinate with construction for services support. The Quality Verification Program will be implemented under MPQAD Procedures.

Team Activities-Status Assessment And Systems Completion

The Team Quality Representative and other MPQAD members assigned to the teams are independent of team control. The system team charter is defined in Field Engineering Procedure FPG 9.700, which indicates that the team quality representative will only receive schedule input from the team supervisor and that other technical and administrative direction will come from MPQAD management. MPQAD approves this procedure and MPQAD Procedure N-4 defines this interface.

All quality department personnel assigned to the team report to the Team Quality Representative who reports solely through the MPQAD management chain.

In addition, the Team Quality Representative is located, based on his permanent reporting assignment, within the MPQAD organization. He will, of course, be required to spend most of his time with the team on field assignments but nevertheless continues as a permanent member of MPQAD.

Organization charts show the reporting channels for the team quality members to emphasize the independence from team technical control.

Administrative controls for team quality members, such as time card approval, overtime approval, etc, are the responsibility of MPQAD supervision assigned to the team organization. A high level manager within MPQAD is specifically responsible for management and performance of the team quality personnel.

The actual inspections are conducted in accordance with PQCIs and IRs approved by MPQAD.

The above controls assure independence of the team quality representatives from the standpoint of location, organization, procedures.

QUESTION A4

"4. A description of the training that will be provided to all personnel including craftpersons. Concerning QC inspector recertification training, describe the actions you have recently taken to address the adequacy of the review of PQCIs prior to training being initiated on the PQCIs. In addition, describe the steps you have taken to ensure that all questions raised during PQCI training sessions will be resolved prior to certification to affected PQCI's."

RESPONSE

Training Of Construction Personnel

The existing construction training procedure (FPG-2.000) is under revision to incorporate the training requirements of the CCP. The procedure sets down specific requirements for type of training and subject matter for each organization element.

The team training will include the major elements described below:

A. General training will be provided in

1. Quality requirements for nuclear work

2. Requirements of the CCP

3. Safety orientation

4. Inspection and work procedures

Training in Items (1) through (3) and selected parts of (4) will be conducted in a formal setting and will be given to all personnel including the craftpersons.

In addition, a "tool box" training session will be conducted periodically for the craftpersons by the foreman. The subject matter will be developed by the training coordinator, and will include information regarding quality issues across the job.

B. Training in the procedures used to govern the performance of work will be conducted for designated field engineering and support personnel as appropriate. In some cases the training will include the craft foreman.

Formal training will be conducted for identified procedures that define the control of the designated work process, procedures for control of special processes and requirements for inspection and acceptance of completed work.

C. Training in procedures for selected processes will be conducted for the craftpersons. This will consist of discussion and/or field

demonstrations for the selected process. A list of the selected processes will be maintained by the Training Coordinator.

Training Of MPQAD Personnel

MPQAD initiated a program in late 1982 to retrain and recertify all Engineer/Constructor QCE's (Inspectors) to existing PQCIs. A significant number of QCE's have been recertified under this process. Early in 1983, MPQAD decided to terminate recertification of old PQCIs, except in selected cases; focus efforts on completing the review and revision of PQCIs; and then train and recertify to the new PQCI.

MPQAD current plans are to re-train and re-certify all inspectors to the revised PQCIs. As a part of this activity, the Project Quality Control Instructions (PQCI) are undergoing a complete review to assure:

Attributes required for the safety and reliability of specific components, systems and structures are identified for verification.

Accept/reject criteria are clearly identified.

Appropriate controls, methods, inspection and/or testing equipment are specified.

Requisite skill levels are required per ANSI N45.2.6 or SNT-TC-1A.

After the PQCIs are revised as necessary, Quality Control Engineers (Inspectors) are being trained and must pass a closed-book examination and a demonstration test to assure their proficiency in utilizing the new instruction. Upon successful completion, each inspector is being certified to perform inspections to those PQCIs in which he was trained.

The following actions are ongoing to maximize the effectiveness of recertification training:

Review PQCI Prior To Initiation Of Training

The adequacy of PQCIs prior to training is assured by the following programmatic requirements:

A. The PQCI evaluation effort is being conducted under the direction of MPQAD QA personnel. MPQAD Procedure E-3M was issued April 11, 1983 and establishes the responsibilities and requirements for the preparation, revision, and control of PQCIs by QA personnel.

   As part of the PQCI revision process, Project Engineering does a review of the PQCI to insure that attributes are identified for inspection according to specification requirements and that clarifications are made to specifications wherever necessary.

B. Whenever a PQCI is revised, the revision is evaluated to determine if a pilot run for testing the implementing capability of the PQCI is

required. If a pilot run is required, the PQCI is tested by a team from QA, QC and Training. Based on this pilot run, the PQCI may be further revised.

C. Once the PQCI is ready for issue, an effectivity date is established in conjunction with the Training Department.

1. For PQCIs on which training was not previously conducted, the training and certification process is then started.

2. For PQCIs on which training and/or certification was previously conducted, a determination is made as to the need for retraining or recertification. When a revised PQCI is issued, it is evaluated in accordance with established procedures to determine if retraining and recertification is required. Based on this evaluation, appropriate action is taken.

D. During the training process, student questions (see below) are monitored. Based on this, further revision to a PQCI may be initiated.

Resolution Of Questions Raised During PQCI Training Sessions

Steps taken to ensure all questions raised during PQCI training sessions are resolved prior to certification include:

A. The development of an MPQA Department "Statement of Training Policy." A copy of this Policy is attached.

B. The Policy Statement is handed out at the start of each class and reviewed with the trainees.

C. Statement 2 of the Policy deals with student questions. Instructors handle many questions as a routine part of a class. However, when an instructor is faced with questions he cannot answer, he makes note of them for subsequent resolution with the students.

D. When required, a QA Engineer, Project/Resident Engineer or other resource person is scheduled to participate as part of the class and answer questions raised by the students.

E. If there are unanswered questions at the end of the scheduled class time, an evaluation is made by the instructor as to whether training can nevertheless be considered complete and the examination given without jeopardizing the students opportunity to satisfactorily write the exam.

F. Even if the examination can be given, prior to answering questions, the questions are still tracked and answered prior to certification.

G. Trainees are encouraged to defer taking examinations or performance demonstrations if they feel they have received inadequate instruction.

MPQA DEPARTMENT STATEMENT OF TRAINING POLICY

It is the objective of the MPQAD Training Department to provide training that meets the needs of the trainees. To help meet these needs the following policies apply:

1. Personnel who are required to attend classroom training shall not be administered an examination without 100% classroom attendance. 100% attendance is defined as total classroom time less instructor excused absences for brief periods of time. A lesser percentage may be requested in writing by the trainees supervisor and approved by the appropriate Training Supervisor.

2. When trainees have pertinent questions that relate to the training subject matter the instructor shall take action to answer the questions or obtain the answers and provide them to the students prior to final examination or certification as appropriate.

3. The time required for self-study prior to examination shall be determined and scheduled by the appropriate Training Coordinator, based on the duration of the lesson and complexity of the subject.

4. The instructor will review the class evaluation sheets or a composite to determine the acceptability of the training prior to administering the exam to the class. If judged unacceptable, the exam will not be administered until appropriate action has been taken.

5. When a trainee indicates that he is not prepared to take an examination or a performance demonstration he shall not be administered the examination or performance demonstration until his specific concerns are resolved.

STUDENT HANDOUT

RAWells R A Wells 4/20/83

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QUESTIONS A6, A7, AND A8

"6. A description of the controls you will use to ensure all problems have been identified during reinspection of a system or area prior to start of repair work or new work on that system or in that area."

"7. A description of the controls you will use to ensure that no new work will be performed that would cause a known nonconformance to be inaccessible."

"8. A description of your proposed program for in-process QC surveillance (inspection) of rework and new work."

RESPONSE

The process for release of work will be controlled by procedures that ensure that the requirements of the CCP are met prior to initiation of new work. The requirements for release of work include; checking, review and approval to ensure that verification and status assessment activities are completed and that the new work activity will not cover up (make inaccessible) items that have existing nonconformances. These procedures are identified in Figure 1. They define the overall process for identification and approval prior to release of work. These procedures require an identification of equipment or items that may be affected by the new work package and a check to see that there are no existing nonconformances or incomplete inspections on these items.

The interactions between project management, the installation team and the QA/QC organization are as follows. Initially, a list of Q items by area will be prepared by the installation team. The complete and inspected items will be provided to the QA/QC organization for the verification of completed work. The remaining items will be placed in an incomplete category and will be the basis for the status assessment by the completion team. The list will be updated as the verification and status assessment activities are carried out and will result in a complete list for each system/area.

The lists from all systems in an area will be combined and will form the basis for management review prior to release of the area for new work. The combined list will be used in the preparation of construction work packages (CWPs) for new work.

There are several major steps in the preparation and approval of the CWP. Each CWP will have a comparable Quality Work Plan (QWP) that defines the quality activities. Inspection hold points will be identified and included in the CWP. Following intitial preparation of the CWP, the package is taken by the team quality representative. The inspection hold points are reviewed and approved by the MPQAD organization and a QWP is initiated for this work activity. The QWP contains the inspection records that will be required for that work activity. A review will be performed to ensure existing nonconformances are not covered up. The review will be based on the steps in the three procedures listed in Figure 1. After the CWP is returned to construction, and the QWP is prepared, work can proceed.

FIGURE 1

Procedures For Controlling Release Of New Work

Procedure	Organization	Purpose
Area Release for Construction (FIG 7.500)	Construction	These three procedures together ensure proper completion of verification and status assessment activities prior to initiation of new work and ensure no cover-up of existing nonconformances
Construction Work Plans (FPG 7.300)	Construction	
Control, Release and Handling of Construction Work Plans and Quality Work Packages (N-17)	MPQAD	

QUESTION A9

"9. A description of the CPCo Management Review process for changes to CCP and how CPCo intends to keep the NRC informed of such changes."

RESPONSE

A procedure (MPPM-19) is being issued to control changes to the CCP. The procedure will provide that Q work activity will meet the requirements of the CCP or will receive management review and approval for any deviation from these requirements. The requirments that must be maintained for work activites under the CCP are:

A. Management reviews are scheduled and held of (1) activity planning for verification and status assessment and (2) results of status assessment and planning for new work activity.

B. A process is in place to ensure that no existing nonconformances will be covered up by new work activities.

C. Procedures to control work definition and release including definition of inspection requirements and hold points are in place.

D. Inspection and contruction personnel involved must have received all required training.

Any work activity that does not meet these conditions will be considered a change. A change will be reviewed by the Construction Implementation Overviewer. The NRC Region III management will be informed prior to implementation.