DmB

UNION ELECTRIC COMPANY
CALLAWAY PLANT

MAILING ADDRESS:
P.O. BOX 620
FULTON, MO. 65251

July 24, 1985

PRIORITY ROUTING
First | Second
RA | NG
DRA | RTG
DRP | DRA
DRS | DRS
DRSS | DRSS
DRMA | DRMA
FILE | PAO

Aug +1

Mr. James G. Keppler
Regional Administrator
Office of Inspection & Enforcement
U.S. Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

ULNRC-1145

Dear Mr. Keppler:

DOCKET NUMBER 50-483
CALLAWAY PLANT UNIT 1
FACILITY OPERATING LICENSE NPF-30
SPECIAL REPORT 85-06
INSERVICE TENDON SURVEILLANCE

The enclosed Special Report is submitted pursuant to Technical Specifications 3.6.1.6.b and 6.9.2 concerning the engineering evaluation of the containment vessel structural integrity during the inservice tendon surveillance. Upon completion of the tendon surveillance as outlined in the attached report, an engineering evaluation will be included in a supplement to this Special Report. This supplemental report will preclude any requirements for additional Special Reports, should the 5% void limit be exceeding during pumping operations of the eight tendons.

S. E. Miltenberger
Manager, Callaway Plant

WRR/RRG/drs
Enclosure

cc: Distribution attached

JUL 26 1985

IE01

cc distribution for ULNRC-1145

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EVALUATION OF INSERVICE TENDON SURVEILLANCE

The Callaway Plant Technical Specification 4.6.1.6.1 requires the demonstration of containment structural integrity through a surveillance of the containment post-tensioning system at the end of 1.5, 3.5, and 5.5 years following the initial structural integrity test, and every 5 years after. During the surveillance of the system after 1.5 years, which began April 29, 1985, it was discovered that the net refill volumes of the sheathing filler material exceeded 5% of the net duct volume for a number of tendons (see attachment 1, Tendon Greasing Summary). This condition failed to meet Tech. Spec. 4.6.1.6.1(e) which requires verification of operability of the sheathing filler material by assuring "(1) No voids in excess of 5% of the net duct volume." Specifically, tendons V65, V66, V74, 1BA and 5BA had filler material volumes equal to 11.2, 10.6, 12.3, 14.4, and 15.2 percent, respectively, of their net duct volumes added after inservice testing. Due to the fact that the 5% excess was discovered after filling, action statement 3.6.1.6.B was immediately satisfied. The NRC Staff concurred with this position in a meeting on July 19, 1985.

The essential criterion for the operability of the sheathing filler material is to prevent corrosion of both the tendon wires and the anchorage components. The material used in the Callaway Plant post-tensioning system, Visconorust 2090P-4, accomplishes this by a characteristic which gives the filler material an affinity to adhere to steel surfaces, its ability to emulsify any moisture in the system nullifying its rusting ability, and by its resistance to moisture, mild acids, and alkalis. In addition, protection is afforded by each tendon wire being individually pre-coated with Amber 1601 prior to installation.

The voids in the tendon sheathing, as indicated by the refill volumes, may be attributed to a number of factors:

1) Visconorust 2090P-4 has a coefficient of expansion which yields an expansion of about 1% per every 20°F. Initial filling temperatures of the filler material averaged 160°F. Cold weather conditions can cool the filler material to 40°F, giving a contraction of 6% of the net duct volume. During the first inservice surveillance of the tendons, the temperature of insitu filler material averaged 90°F, giving a contraction of 3 to 4% from initial fill.

2) Calculated voids between the wires which comprise the tendon bundle are approximately 7%, or greater, of the net duct volume. During the initial filling operations, the tendon bundle was cold (ambient temperature of 65°F) and as the filler material was pumped into the sheathing void, it solidified on the surface of the tendon bundle, leaving small voids between the wires. As the filler material gradually heated the tendon bundle, it is likely that the voids between the wires allowed migration of the filler material into the tendon bundle. Because this process is slow and gradual, it is reasonable to expect that it took place substantially after the filling operation was complete and possibly during the surveillance refill operation. In addition, this type of migration could also occur at other areas such as where tendons are in contact with the sheathing.

3) Characteristics of the initial filling method may induce air entrapment into the filler material. Pumping operations can introduce air into filler material and may add up to as much as 2% of the net duct volume. This void value could be higher for horizontal tendons due to the lower pumping head used when compared to the vertical tendons.

In summary, even under optimum filling conditions, voids ranging from 12-15% could be expected after the initial filling operation.

The Callaway Plant tendons requiring net refill volumes of the filler material in excess of the acceptance criteria have not shown any abnormal deterioration or degradation of strength. The lift-off forces for those tendons, as well as the other surveillance tendons, have been found to fall within (or above) the predicted limits (see attachment 2, Preliminary Lift-Off Force Data Sheets). Examination and testing of the individual wires from tendons V74 and 26AC has revealed that there is no evidence of corrosion and that wire strength exceeds the minimum required ultimate strength through-out the wires (see attachment 3, Preliminary Wire Test Data Sheets). Examination of the filler material has shown virtually no change in the physical appearance or chemical properties. Test results indicate that the amount of chlorides, sulfides, nitrates, and moisture fall far below the maximum allowed limits as specified by the manufacturer (see attachment 4, Grease Sample Analysis). Visual inspection of the different components of the anchorage system revealed proper coverage by the filler material with no signs of corrosion or presence of water.

As indicated by the test results above, the function of the filler material in protecting the post-tensioning system is being maintained. As long as sufficient filler material has been introduced into the system to completely coat the wires and anchorage system, corrosion protection is assured. Voids, such as those experienced at the Callaway Plant, can be expected due to the characteristics of the filler material and initial filling operations as noted above. Since each wire is individually pre-coated with Amber 1601, the degree of filling interstitial spaces, which comprise the net duct volume, is not directly related to the degree of

coating which occurs, and therefore, is not of significant importance as an indicator of operability of the sheathing filler material.

Based on physical tests on the tendon wires and chemical test of the filler material, there seems to be little correlation between the 5% void requirement and the structural integrity of the tendon and anchorage system.

Based on the above demonstrated compliance with all remaining surveillance requirements for Tech. Spec. 4.6.1.6.1, it is concluded that those instances of "voids in excess of 5% of the net duct volume" have not resulted in any degradation of the post-tensioning system, assuring the structural integrity of the containment vessel.

As of this date, 3 of the 11 surveillance tendons have been completed. Two tendons, not in the surveillance program, have also been filled to provide additional data for this report. Although there are 8 remaining to be pumped, it is anticipated that results of these 8 will correlate with the 5 already complete. Upon completion of the tendon surveillance, an engineering evaluation will be included in a supplement to this special report. This supplemental report will preclude any requirements for additional special reports, should the 5% void limit be exceeded during pumping operations of the 8 tendons.

Based on the above discussion, the current Technical Specification is not appropriate. Following the final engineering evaluation, Union Electric will propose a revision to the Technical Specification with the requisite documentation and justification.

In addition, future scheduled surveillances of the post-tensioning system and full pressure integrated leak rate tests will monitor the

parameters discussed above to detect any potential abnormal degradation, assure continued operability of the system, and verify containment structural integrity on a continuing basis.

TENDON SURVEILLANCE GREASING SUMMARY

TENDON	NET DUCT VOLUME (GAL.)	NET GREASE ADDED (GAL.)	% GREASE ADDED
V20	288	2 1/2	0.9
V35	277	12 3/4	4.6
V65	289	32 1/2	11.2
*V66	289	30 3/4	10.6
**V74	284	35	12.3
1CB	185	2 1/3	1.4
*1BA	189	27 1/4	14.4
5BA	181	27 1/2	15.2
9CB	185	1	0.5
9AC	185	2	1.1
**26AC	185	1	0.5
45BA	185	1	0.5
51BA	185	2	1.1

* Not in surveillance sample (supplemental data)

** Wire pulled and tested during surveillance

MONITORING OF TENDON FORCE - PROCEDURE SQ 9.0

DATA SHEET 9.0 - INSPECTION DOCUMENTATION

Inryco
an Inland Steel company

PROJECT CALLAWAY SURVEILLANCE NO. 1 YEAR 85
180° AZIMUTH 05/31/85

TENDON NO. V20 TENDON END/BUTTRESS NO. SHOP UNIT 1

Q.C. Signoff

(9.2) Concrete Temp. 72 F Therm. No. ST-62 Recal Date 4/24/86

(9.4) Amount of Effective Wires (From DS 8.0 - 8.3.7.3) 169 05/21/85

(9.5.1) Ram ID 8813 Recal Date JOB END Ram Area 337.526 K= -11.174 05/21/85
Gauge ID FORNEY #7 Recal Date DAILY Daily Check OK 05/21/85

(9.6) Shim Stack Height #1 20.50 #2 20.50 Ruler ID R21 Recal Date 4/24/86 05/21/85

(9.7.2) Tendon Overstress 4050 (TARGET) (DO NOT EXCEED 4750 PSI) (Shall not exceed 1602 kips for a 170 wire tendon) 05/21/85
9LL 1161 LBL 1286 UBL 1427

(9.8.1.1) Actual Tendon Overstress Value 4400 (Force in kips or Pressure in PSI) 05/21/85

(9.8.5.2) ACTUAL LIFTOFF VALUES (9.8.5.3) CIRCLED

	Stack #1	Stack #2	Actual
1	4300	(4300)	4300
2	4320	(4320)	4320
3	4320	(4320)	4320

Actual Average 4313 = 1444.5 KIPS 05/21/85

(9.8.6.3) LIFTOFFS AVERAGE AS FOUND LIFTOFF FOR TENDON V20 = 1411 KIPS 05/22/85

(9.8.6) Acceptable ✓YES 05/22/85
(9.8.6.1) AALV UBL: Conditional Acceptance N/A Notify Owner N/A 05/22/85
(9.8.6.2) AALV LBL: Unacceptable N/A Detension N/A NCR No. N/A 05/22/85

(9.8.7.1) ADJACENT TENDON LIFTOFF REQUIRED N/A Tendon #1 N/A
Notify Owner N/A Tendon #2 N/A 05/22/85

(9.8.8.3) RESET SHIM STACK HEIGHT: #1 Stack N/A #2 Stack N/A 05/22/85

(9.8.8.4) NEW ACTUAL LIFTOFF VALUE N/A (9.8.8.5) CIRCLED

	Stack #1	Stack #2	Actual
1	N/A	N/A	N/A
2	N/A	N/A	N/A
3	N/A	N/A	N/A

Actual Average N/A 05/22/85

(9.8.10) ADJACENT TENDON LIFTOFF

(9.8.10.3) #1 Accept N/A Unacceptable N/A
(9.8.10.3) #2 Accept N/A Unacceptable N/A Notify Owner N/A 05/22/85

Q.C. Review _____ Level ____ Date _____

Title _____

MONITORING OF TENDON FORCE - PROCEDURE SQ 9.0

DATA SHEET 9.0 - INSPECTION DOCUMENTATION

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PROJECT CALLAWAY SURVEILLANCE NO. 1 YEAR 85
0° AZIMUTH 08 5/31/85

TENDON NO. V20 TENDON END/BUTTRESS NO. FIELD UNIT 1

	Q.C. Signoff
(9.2) Concrete Temp. 76 F Therm. No. ST-62 Recal Date 4/24/86	
(9.4) Amount of Effective Wires (From DS 8.0 - 8.3.7.3) 170* NOTE: #9 WIRE TENDON - WIRE MISSING ON SHOP END.	08 5/22/85
(9.5.1) Ram ID 8754 Recal Date JOB END Ram Area 335.563 K= -11.527	08 5/22/85
Gauge ID FORNEY #1 Recal Date DAILY Daily Check OK	08 5/22/85
(9.6) Shim Stack Height #1 1.785 #2 1.785 Ruler ID R21 Recal Date 4/24/86	08 5/22/85
(9.7.2) Tendon Overstress 4100 TARGET - DO NOT EXCEED 4780 psi (Shall not exceed 1602 kips for a 170 wire tendon)	08 5/22/85
9LL 1161 LBL 1286 UBL 1427	
(9.8.1.1) Actual Tendon Overstress Value 4240 (Force in kips or Pressure in PSI)	08 5/22/85

(9.8.5.2) ACTUAL LIFTOFF VALUES

	Stack #1	Stack #2	(9.8.5.3) CIRCLED
1	4140	(4140)	4140
2	4120	(4140)	4140
3	4120	(4142)	4140

Actual Average 4140 = 1378 KIPS 08 5/22/85

(9.8.6.3) LIFTOFFS AVERAGE AS FOUND LIFTOFF FOR TENDON V20 = 1411 KIPS

(9.8.6) Acceptable ✓ YES	08 5/22/85
(9.8.6.1) AALV UBL: Conditional Acceptance N/A Notify Owner N/A	08 5/22/85
(9.8.6.2) AALV LBL: Unacceptable N/A Detension N/A NCR No. N/A	08 5/22/85
(9.8.7.1) ADJACENT TENDON LIFTOFF REQUIRED N/A Tendon #1 N/A	
Notify Owner N/A Tendon #2 N/A	08 5/22/85
(9.8.8.3) RESET SHIM STACK HEIGHT: #1 Stack N/A #2 Stack N/A	08 5/22/85

(9.8.8.4) NEW ACTUAL LIFTOFF VALUE N/A (9.8.8.5) CIRCLED

	Stack #1	Stack #2	Actual
1	N/A	N/A	N/A
2	N/A	N/A	N/A
3	N/A	N/A	N/A

Actual Average N/A 08 5/22/85

(9.8.10) ADJACENT TENDON LIFTOFF

(9.8.10.3) #1 Accept N/A Unacceptable N/A	
(9.8.10.3) #2 Accept N/A Unacceptable N/A Notify Owner N/A	08 5/22/85

Q.C. Review _____ Level ____ Date _____

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MONITORING OF TENDON FORCE - PROCEDURE SQ 9.0

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PROJECT CALLAWAY SURVEILLANCE NO. 1 YEAR 85
210° AZIMUTH

TENDON NO. V35 TENDON END/BUTTRESS NO. SHOP UNIT 1

	Q.C. Signoff
(9.2) Concrete Temp. 78 F Therm. No. ST-62 Recal Date 4/24/86	
(9.4) Amount of Effective Wires (From DS 8.0 - 8.3.7.3) 169	CB 5/22/85
(9.5.1) Ram ID 8813 Recal Date JOB END Ram Area 337.526 K= -11.174	CB 5/22/85
Gauge ID FORNEY#1 Recal Date DAILY Daily Check OK	CB 5/22/85
(9.6) Shim Stack Height #1 18.30 #2 18.35 Ruler ID R21 Recal Date 4/24/86	CB 5/22/85
4020 psi: TARGET - DO NOT EXCEED 4750 PSI	
(9.7.2) Tendon Overstress 1344 (Shall not exceed 1602 kips for a 170 wire tendon)	CB 5/22/85
9LL 1153 LBL 1278 UBL 1410	
(9.8.1.1) Actual Tendon Overstress Value 4300 (Force in kips or Pressure in PSI)	CB 5/22/85

(9.8.5.2) ACTUAL LIFTOFF VALUES (9.8.5.3) CIRCLED

	Stack #1	Stack #2	Actual
1	4180	(4180)	4180
2	4170	(4170)	4170
3	4180	(4180)	4180

Actual Average 4176 = 1398.5 KIPS — CB 5/22/85

AVERAGE AS FOUND LIFTOFF FOR TENDON V35 = 1418 KIPS CB 5/23/85

(9.8.6.3) LIFTOFFS

REFER NCR # 2389-1

	Q.C. Signoff
(9.8.6) Acceptable NO	CB 5/23/85
(9.8.6.1) AALV UBL: Conditional Acceptance N/A Notify Owner YES	CB 5/23/85
(9.8.6.2) AALV LBL: Unacceptable N/A Detension N/A NCR No. N/A	CB 5/23/85
(9.8.7.1) ADJACENT TENDON LIFTOFF REQUIRED N/A Tendon #1 N/A	
Notify Owner N/A Tendon #2 N/A	CB 5/23/85
(9.8.8.3) RESET SHIM STACK HEIGHT: #1 Stack N/A #2 Stack N/A	CB 5/23/85
(9.8.8.4) NEW ACTUAL LIFTOFF VALUE N/A (9.8.8.5) CIRCLED	

	Stack #1	Stack #2	Actual
1	N/A	N/A	N/A
2	N/A	N/A	N/A
3	N/A	N/A	N/A

Actual Average N/A — CB 5/23/85

(9.8.10) ADJACENT TENDON LIFTOFF

(9.8.10.3) #1 Accept N/A Unacceptable N/A	
(9.8.10.3) #2 Accept N/A Unacceptable N/A Notify Owner N/A	CB 5/23/85

Q.C. Review _____ Level ____ Date _____

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PROJECT CALLAWAY SURVEILLANCE NO. 1 YEAR 85
330° AZIMUTH 4/3/85

TENDON NO. V35 TENDON END/BUTTRESS NO. FIELD UNIT 1

	Q.C. Signoff
(9.2) Concrete Temp. 76 F Therm. No. ST-62 Recal Date 4/24/86	
(9.4) Amount of Effective Wires (From DS 8.0 - 8.3.7.3) 170	5/23/85
(9.5.1) Ram ID 8754 Recal Date JOB END Ram Area 335.563 K= -11.527	5/23/85
Gauge ID FARNEY #7 Recal Date DAILY Daily Check OK	5/23/85
(9.6) Shim Stack Height #1 19.35 #2 19.35 Ruler ID R21 Recal Date 4/24/86 (4040 PSI TARGET)	5/23/85
(9.7.2) Tendon Overstress 1344 (Shall not exceed 1602 kips for a 170 wire tendon) (DO NOT EXCEED 4780 PSI)	5/23/85
9LL 1153 LBL 1278 UBL 1410	
(9.8.1.1) Actual Tendon Overstress Value 4380 (Force in kips or Pressure in PSI)	5/23/85

(9.8.5.2) ACTUAL LIFTOFF VALUES

	Stack #1	Stack #2	Actual
1	4180	(4320)	4320
2	4180	(4320)	4320
3	4180	(4320)	4320

(9.8.5.3) CIRCLED

Actual Average 4320 = 1438 5/23/85

(9.8.6.3) LIFTOFFS

AVERAGE AS FOUND LIFTOFF FOR TENDON V35 = 1418 KIPS

REFER NCR # 2389-1 5/23/85

(9.8.6) Acceptable NO	5/23/85
(9.8.6.1) AALV UBL: Conditional Acceptance N/A Notify Owner YES	5/23/85
(9.8.6.2) AALV LBL: Unacceptable N/A Detension N/A NCR No. N/A	5/23/85
(9.8.7.1) ADJACENT TENDON LIFTOFF REQUIRED N/A Tendon #1 N/A	5/23/85
Notify Owner N/A Tendon #2 N/A	
(9.8.8.3) RESET SHIM STACK HEIGHT: #1 Stack N/A #2 Stack N/A	5/23/85

(9.8.8.4) NEW ACTUAL LIFTOFF VALUE N/A (9.8.8.5) CIRCLED

	Stack #1	Stack #2	Actual
1	N/A	N/A	N/A
2	N/A	N/A	N/A
3	N/A	N/A	N/A

Actual Average N/A 5/23/85

(9.8.10) ADJACENT TENDON LIFTOFF

(9.8.10.3) #1 Accept N/A Unacceptable N/A	
(9.8.10.3) #2 Accept N/A Unacceptable N/A Notify Owner N/A	5/23/85

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MONITORING OF TENDON FORCE - PROCEDURE SQ 9.0

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PROJECT CALLAWAY SURVEILLANCE NO. 1 YEAR 85

TENDON NO. V65 TENDON END/BUTTRESS NO. SHOP (90° AZIMUTH ON 3/31/86) UNIT 1

	Q.C. Signoff
(9.2) Concrete Temp. 70 F Therm. No. ST-62 Recal Date 4/24/86	
(9.4) Amount of Effective Wires (From DS 8.0 - 8.3.7.3) 170	5/24/86
(9.5.1) Ram ID 8754 Recal Date JOB END Ram Area 335.563 K= -11.527	5/24/86
Gauge ID FORNEY #1 Recal Date DAILY Daily Check OK	5/24/86
(9.6) Shim Stack Height #1 19.90 #2 19.90 Ruler ID R21 Recal Date 4/24/86	5/24/86
(9.7.2) Tendon Overstress 1398 (Shall not exceed 1602 kips for a 170 wire tendon) (4200 PSI TARGET) (DO NOT EXCEED 4800 PSI)	5/24/86
9LL 1193 LBL 1327 UBL 1469	
(9.8.1.1) Actual Tendon Overstress Value 4320 (Force in kips or Pressure in PSI)	5/24/86

(9.8.5.2) ACTUAL LIFTOFF VALUES

Stack #1		Stack #2		Actual	
1	4280	1	(4280)	1	4280
2	4280	2	(4280)	2	4280
3	4280	3	(4280)	3	4280

(9.8.5.3) CIRCLED

Actual Average 4280 = 1424 — 5/24/86

AVERAGE AS FOUND LIFTOFF FOR TENDON V65 = 1449.5 KIPS

(9.8.6.3) LIFTOFFS

(9.8.6) Acceptable YES	5/24/86
(9.8.6.1) AALV UBL: Conditional Acceptance N/A Notify Owner N/A	5/24/86
(9.8.6.2) AALV LBL: Unacceptable N/A Detension N/A NCR No. N/A	5/24/86
(9.8.7.1) ADJACENT TENDON LIFTOFF REQUIRED N/A Tendon #1 N/A	
Notify Owner N/A Tendon #2 N/A	5/24/86
(9.8.8.3) RESET SHIM STACK HEIGHT: #1 Stack N/A #2 Stack N/A	5/24/86

(9.8.8.4) NEW ACTUAL LIFTOFF VALUE N/A (9.8.8.5) CIRCLED

Stack #1		Stack #2		Actual	
1	N/A	1	N/A	1	N/A
2	N/A	2	N/A	2	N/A
3	N/A	3	N/A	3	N/A

Actual Average N/A — 5/24/86

(9.8.10) ADJACENT TENDON LIFTOFF

(9.8.10.3) #1 Accept N/A Unacceptable N/A	
(9.8.10.3) #2 Accept N/A Unacceptable N/A Notify Owner N/A	5/24/86

Q.C. Review _____ Level ____ Date _____

Title _____

MONITORING OF TENDON FORCE - PROCEDURE SQ 9.0

DATA SHEET 9.0 - INSPECTION DOCUMENTATION

Inryco
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PROJECT CALLAWAY SURVEILLANCE NO. 1 YEAR 85
290° AZIMUTH 5/31/85

TENDON NO. V65 TENDON END/BUTTRESS NO. FIELD UNIT 1

	Q.C. Signoff
(9.2) Concrete Temp. 72 F Therm. No. ST-62 Recal Date 4/24/86	
(9.4) Amount of Effective Wires (From DS 8.0 - 8.3.7.3) 170	5/23/85
(9.5.1) Ram ID 8813 Recal Date JOB END Ram Area 337.526 K= -11.174	5/23/85
Gauge ID FORNEY#7 Recal Date DAILY Daily Check OK	5/23/85
(9.6) Shim Stack Height #1 20.10 #2 20.10 Ruler ID R21 Recal Date 4/24/86 (4170PSI-TARGET DO NOT EXCEED 4780 psi)	5/23/85
(9.7.2) Tendon Overstress 1398 (Shall not exceed 1602 kips for a 170 wire tendon) 9LL 1193 LBL 1327 UBL 1469	5/23/85
(9.8.1.1) Actual Tendon Overstress Value 4460 (Force in kips or Pressure in PSI)	5/23/85

(9.8.5.2) ACTUAL LIFTOFF VALUES

Stack #1	Stack #2	(9.8.5.3) CIRCLED Actual
1 4420	1 (4420)	1 4420
2 4380	2 (4390)	2 4390
3 4400	3 (4400)	3 4400

Actual Average 4403 = 1475 KIPS 5/23/85

(9.8.6.3) LIFTOFFS AVERAGE AS FOUND LIFTOFF FOR TENDON V65 = 1449.5 KIPS 5/24/85

(9.8.6) Acceptable YES	5/24/85
(9.8.6.1) AALV UBL: Conditional Acceptance N/A Notify Owner N/A	5/24/85
(9.8.6.2) AALV LBL: Unacceptable N/A Detension N/A NCR No. N/A	5/24/85
(9.8.7.1) ADJACENT TENDON LIFTOFF REQUIRED N/A Tendon #1 N/A Notify Owner N/A Tendon #2 N/A	5/24/85
(9.8.8.3) RESET SHIM STACK HEIGHT: #1 Stack N/A #2 Stack N/A	5/24/85

(9.8.8.4) NEW ACTUAL LIFTOFF VALUE N/A (9.8.8.5) CIRCLED

Stack #1	Stack #2	Actual
1 N/A	1 N/A	1 N/A
2 N/A	2 N/A	2 N/A
3 N/A	3 N/A	3 N/A

Actual Average N/A 5/24/85

(9.8.10) ADJACENT TENDON LIFTOFF

(9.8.10.3) #1 Accept N/A Unacceptable N/A	
(9.8.10.3) #2 Accept N/A Unacceptable N/A Notify Owner N/A	5/24/85

Q.C. Review _____ Level ____ Date _____

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MONITORING OF TENDON FORCE - PROCEDURE SQ 9.0

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Inryco
an Inland Steel company

PROJECT CALLAWAY SURVEILLANCE NO. 1 YEAR 85

TENDON NO. V74 TENDON END/BUTTRESS NO. SHOP 70° AZIMUTH 05/21/85 UNIT 1

	Q.C. Signoff
(9.2) Concrete Temp. 72 F Therm. No. ST-62 Recal Date 4/24/86	
(9.4) Amount of Effective Wires (From DS 8.0 - 8.3.7.3) 169	05/28/85
(9.5.1) Ram ID 8754 Recal Date JOB END Ram Area 335.563 K= -11.527	05/28/85
Gauge ID FORNEY#1 Recal Date DAILY Daily Check OK	05/28/85
(9.6) Shim Stack Height #1 19.80 #2 19.80 Ruler ID R21 Recal Date 4/24/86	05/28/85
4030PSI TARGET (DO NOT EXCEED 4780 PSI)	
(9.7.2) Tendon Overstress 1340 (Shall not exceed 1602 kips for a 170 wire tendon)	05/28/85
9LL 1152 LBL 1277 UBL 1402	
(9.8.1.1) Actual Tendon Overstress Value 4360 (Force in kips or Pressure in PSI)	05/28/85

(9.8.5.2) ACTUAL LIFTOFF VALUES

		(9.8.5.3) CIRCLED			
Stack #1 - 1	4320	Stack #2 - 1	(4340)	Actual 1	4340
2	4290	2	(4340)	2	4340
3	4290	3	(4340)	3	4340

Actual Average 4340 = 1445 KIPS — 05/28/85

(9.8.6.3) LIFTOFFS

AVERAGE AS FOUND LIFTOFF FOR TENDON V74 = 1451 KIPS
REFER NCR # 2389-2

(9.8.6) Acceptable NO	05/28/85
(9.8.6.1) AALV UBL: Conditional Acceptance N/A Notify Owner YES	05/28/85
(9.8.6.2) AALV LBL: Unacceptable N/A Detension N/A NCR No. N/A	05/28/85
(9.8.7.1) ADJACENT TENDON LIFTOFF REQUIRED N/A Tendon #1 N/A	
Notify Owner N/A Tendon #2 N/A	05/28/85
(9.8.8.3) RESET SHIM STACK HEIGHT: #1 Stack N/A #2 Stack N/A	05/28/85

(9.8.8.4) NEW ACTUAL LIFTOFF VALUE N/A (9.8.8.5) CIRCLED

Stack #1 - 1	N/A	Stack #2 - 1	N/A	Actual 1	N/A
2	N/A	2	N/A	2	N/A
3	N/A	3	N/A	3	N/A

Actual Average N/A — 05/28/85

(9.8.10) ADJACENT TENDON LIFTOFF

(9.8.10.3) #1 Accept N/A Unacceptable N/A	
(9.8.10.3) #2 Accept N/A Unacceptable N/A Notify Owner N/A	05/28/85

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Inryco
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PROJECT CALLAWAY SURVEILLANCE NO. 1 YEAR 85

TENDON NO. V74 TENDON END/BUTTRESS NO. F/ELD 290° AZIMUTH 05/31/85 UNIT 1

	Q.C. Signoff
(9.2) Concrete Temp. 74 F Therm. No. ST-62 Recal Date 4/24/86	
(9.4) Amount of Effective Wires (From DS 8.0 - 8.3.7.3) 170	05/23/85
(9.5.1) Ram ID 8813 Recal Date JOB END Ram Area 337.526 K= 11.174	05/23/85
Gauge ID FORNEY #7 Recal Date DAILY Daily Check OK	05/23/85
(9.6) Shim Stack Height #1 19.60 #2 19.60 Ruler ID R21 Recal Date 4/24/86	05/23/85
(9.7.2) Tendon Overstress 1340 (Shall not exceed 1602 kips for a 170 wire tendon) 4000 PSI TARGET (DO NOT EXCEED 4780 PSI)	05/23/85
9LL 1152 LBL 1277 UBL 1402	
(9.8.1.1) Actual Tendon Overstress Value 4400 (Force in kips or Pressure in PSI)	05/23/85

(9.8.5.2) ACTUAL LIFTOFF VALUES (9.8.5.3) CIRCLED

	Stack #1	Stack #2	Actual
1	4300	(4350)	4350
2	4290	(4350)	4350
3	4280	(4350)	4350

Actual Average 4350 = 1457 KIPS 05/23/85

(9.8.6.3) LIFTOFFS AVERAGE AS FOUND LIFTOFF FOR TENDON V74 = 1451 KIPS 05/28/85 REFER NCR # 2389-2

(9.8.6) Acceptable NO		05/28/85
(9.8.6.1) AALV UBL: Conditional Acceptance N/A	Notify Owner YES	05/28/85
(9.8.6.2) AALV LBL: Unacceptable N/A	Detension N/A NCR No. N/A	05/28/85
(9.8.7.1) ADJACENT TENDON LIFTOFF REQUIRED N/A	Tendon #1 N/A	
Notify Owner N/A	Tendon #2 N/A	05/28/85
(9.8.8.3) RESET SHIM STACK HEIGHT: #1 Stack N/A	#2 Stack N/A	05/28/85

(9.8.8.4) NEW ACTUAL LIFTOFF VALUE N/A (9.8.8.5) CIRCLED

	Stack #1	Stack #2	Actual
1	N/A	N/A	N/A
2	N/A	N/A	N/A
3	N/A	N/A	N/A

Actual Average _____ 05/28/85

(9.8.10) ADJACENT TENDON LIFTOFF

(9.8.10.3) #1 Accept N/A	Unacceptable N/A	
(9.8.10.3) #2 Accept N/A	Unacceptable N/A	Notify Owner N/A 05/28/85

Q.C. Review _____ Level ____ Date _____

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MONITORING OF TENDON FORCE - PROCEDURE SQ 9.0

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PROJECT CALLAWAY SURVEILLANCE NO. 1 YEAR 85

TENDON NO. 1CB TENDON END/BUTTRESS NO. SHOP/BUTT "B" UNIT 1

Q.C. Signoff

(9.2) Concrete Temp. 62 F Therm. No. ST-62 Recal Date 4/24/86

(9.4) Amount of Effective Wires (From DS 8.0 - 8.3.7.3) 170

(9.5.1) Ram ID 9364 Recal Date JOB END Ram Area 209.535 K= -2.356
Gauge ID FORNEY #7 Recal Date DAILY Daily Check OK

(9.6) Shim Stack Height #1 13.80 #2 13.80 Ruler ID R21 Recal Date 4/24/86
TARGET psi: (DO NOT EXCEED 7610 psi:)

(9.7.2) Tendon Overstress 6230 (Shall not exceed 1602 kips for a 170 wire tendon)
9LL 1110 LBL 1235 UBL 1369

(9.8.1.1) Actual Tendon Overstress Value 7000 (Force in kips or Pressure in PSI)

(9.8.5.2) ACTUAL LIFTOFF VALUES (9.8.5.3) CIRCLED

	Stack #1	Stack #2	Actual
1	5920	(6620)	6620
2	5900	(6600)	6600
3	6020	(6600)	6600

Actual Average 6606 = 1382 KIPS

AVERAGE AS FOUND LIFTOFF FOR TENDON 1CB = 1371 KIPS

(9.8.6.3) LIFTOFFS

(9.8.6) Acceptable NO REFER NCR # 2389-4

(9.8.6.1) AALV UBL: Conditional Acceptance N/A Notify Owner YES

(9.8.6.2) AALV LBL: Unacceptable N/A Detension N/A NCR No. N/A

(9.8.7.1) ADJACENT TENDON LIFTOFF REQUIRED N/A Tendon #1 N/A
Notify Owner N/A Tendon #2 N/A

(9.8.8.3) RESET SHIM STACK HEIGHT: #1 Stack N/A #2 Stack N/A

(9.8.8.4) NEW ACTUAL LIFTOFF VALUE N/A (9.8.8.5) CIRCLED

	Stack #1	Stack #2	Actual
1	N/A	N/A	N/A
2	N/A	N/A	N/A
3	N/A	N/A	N/A

Actual Average N/A

(9.8.10) ADJACENT TENDON LIFTOFF

(9.8.10.3) #1 Accept N/A Unacceptable N/A
(9.8.10.3) #2 Accept N/A Unacceptable N/A Notify Owner N/A

Q.C. Review _____ Level ____ Date _____

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PROJECT CALLAWAY SURVEILLANCE NO. 1 YEAR 85

TENDON NO. 1CB TENDON END/BUTTRESS NO. FIELD / C UNIT 1

(9.2) Concrete Temp. 80° F Therm. No. ST-62 Recal Date 4/24/85 — Q.C. Signoff

(9.4) Amount of Effective Wires (From DS 8.0 - 8.3.7.3) 170 — CJ 6/6/85

(9.5.1) Ram ID 9863 Recal Date JOB END Ram Area 211.687 K= -10.251 — CJ 6/6/85
Gauge ID FORNEY #7 Recal Date DAILY Daily Check OK — CJ 6/6/85

(9.6) Shim Stack Height #1 12.70 #2 12.70 Ruler ID R21 Recal Date 4/24/86 — CJ 6/6/85

(9.7.2) Tendon Overstress 7610 P.S.I. ← DO NOT EXCEED (6200psi TARGET) (Shall not exceed 1602 kips for a 170 wire tendon) — CJ 6/6/85
9LL 1110^ LBL 1235^ UBL 1369^

(9.8.1.1) Actual Tendon Overstress Value 6700 (Force in kips or Pressure in PSI) — CJ 6/6/85

(9.8.5.2) ACTUAL LIFTOFF VALUES (9.8.5.3) CIRCLED

Stack #1		Stack #2		Actual	
1	6480	1	(6480)	1	6480
2	6480	2	(6480)	2	6480
3	6480	3	(6480)	3	6480
			Actual Average		6480

CJ 6/6/85

AVERAGE AS FOUND LIFTOFF FOR TENDON 1CB = 1371 KIPS 1361 KIPS

(9.8.6.3) LIFTOFFS REFER NCR #2389-4 CB 6/11/85

(9.8.6) Acceptable ~~YES~~ NO CB 6/11/85 — CJ 6/6/85

(9.8.6.1) AALV UBL: Conditional Acceptance N/A Notify Owner N/A YES CB 6/11/85 — CJ 6/6/85

(9.8.6.2) AALV LBL: Unacceptable NA Detension N/A NCR No. N/A — CJ 6/6/85

(9.8.7.1) ADJACENT TENDON LIFTOFF REQUIRED N/A Tendon #1 N/A
Notify Owner N/A Tendon #2 N/A — CJ 6/6/85

(9.8.8.3) RESET SHIM STACK HEIGHT: #1 Stack N/A #2 Stack N/A — CJ 6/6/85

(9.8.8.4) NEW ACTUAL LIFTOFF VALUE N/A (9.8.8.5) CIRCLED

Stack #1		Stack #2		Actual	
1	N/A	1	N/A	1	N/A
2	N/A	2	N/A	2	N/A
3	N/A	3	N/A	3	N/A
			Actual Average		N/A

CB 6/6/85

(9.8.10) ADJACENT TENDON LIFTOFF

(9.8.10.3) #1 Accept N/A Unacceptable N/A
(9.8.10.3) #2 Accept N/A Unacceptable N/A Notify Owner N/A — CJ 6/6/85

Q.C. Review [signature] Level II Date 6/26/85

Title Q.C. INSPECTOR

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Inryco
an Inland Steel company

PROJECT CALLAWAY SURVEILLANCE NO. 1 YEAR 85

TENDON NO. 9-CB TENDON END/BUTTRESS NO. SHOP / B UNIT 1

Q.C. Signoff

(9.2) Concrete Temp. 75° F Therm. No. ST-63 Recal Date 4/24/86

(9.4) Amount of Effective Wires (From DS 8.0 - 8.3.7.3) 169

(9.5.1) Ram ID 9364 Recal Date JOB END Ram Area 209.535 K= -2.356
Gauge ID Feeney #1 Recal Date DAILY Daily Check OK

(9.6) Shim Stack Height #1 14.5" #2 14.6" Ruler ID R17 Recal Date 4/24/86

(9.7.2) Tendon Overstress TARGET 6290 PSI (Shall not exceed 1602 kips for a 170 wire tendon) DO NOT EXCEED 7610 PSI.
9LL 1112# LBL 1236# UBL 1336#

(9.8.1.1) Actual Tendon Overstress Value 6800 P.S.I. (Force in kips or Pressure in PSI)

(9.8.5.2) ACTUAL LIFTOFF VALUES

Stack #1 - 1 6420
2 6420
3 6420

Stack #2 - 1 5580
2 5580
3 5620

(9.8.5.3) CIRCLED

Actual 1 6420
2 6420
3 6420
Actual Average 6420 = 1343 KIPS

AVERAGE AS FOUND LIFTOFF FOR TENDON 9CB = 1324 KIPS @ 6/11/85

(9.8.6.3) LIFTOFFS

(9.8.6) Acceptable YES

(9.8.6.1) AALV UBL: Conditional Acceptance N/A Notify Owner N/A

(9.8.6.2) AALV LBL: Unacceptable N/A Detension N/A NCR No. N/A

(9.8.7.1) ADJACENT TENDON LIFTOFF REQUIRED N/A Tendon #1 N/A
Notify Owner N/A Tendon #2 N/A

(9.8.8.3) RESET SHIM STACK HEIGHT: #1 Stack N/A #2 Stack N/A

(9.8.8.4) NEW ACTUAL LIFTOFF VALUE N/A

(9.8.8.5) CIRCLED

Stack #1 - 1 N/A
2 N/A
3 N/A

Stack #2 - 1 N/A
2 N/A
3 N/A

Actual 1 N/A
2 N/A
3 N/A
Actual Average N/A

(9.8.10) ADJACENT TENDON LIFTOFF

(9.8.10.3) #1 Accept N/A Unacceptable N/A
(9.8.10.3) #2 Accept N/A Unacceptable N/A Notify Owner N/A

Q.C. Review [signature] Level II Date 6/26/85

Title Q.E. INSPECTOR

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0640N CS204-8/84 INRYCO, Inc.

MONITORING OF TENDON FORCE - PROCEDURE SQ 9.0

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Inryco
an Inland Steel company

PROJECT CALLAWAY SURVEILLANCE NO. 1 YEAR 85

TENDON NO. 9CB TENDON END/BUTTRESS NO. FIELD/BUTT C UNIT 1

	Q.C. Signoff
(9.2) Concrete Temp. 80 F Therm. No. ST-62 Recal Date 4/24/86	
(9.4) Amount of Effective Wires (From DS 8.0 - 8.3.7.3) 169	CT 6/7/85
(9.5.1) Ram ID 9363 Recal Date JOB END Ram Area 211.687 K= -10.251	CT 6/7/85
Gauge ID ARMEY#7 Recal Date DAILY Daily Check OK	CT 6/7/85
(9.6) Shim Stack Height #1 13.30 #2 13.30 Ruler ID R21 Recal Date 4/24/86	CT 6/7/85
(9.7.2) Tendon Overstress TARGET 6120 psi (Shall not exceed 1602 kips for a 170 wire tendon) DO NOT EXCEED 7570 psi	CT 6/7/85
9LL 1112 LBL 1236 UBL 1336	
(9.8.1.1) Actual Tendon Overstress Value 6350 (Force in kips or Pressure in PSI)	CT 6/7/85

(9.8.5.2) ACTUAL LIFTOFF VALUES

Stack #1 - 1	6200	Stack #2 - 1	(6220)	Actual	1	6220	
2	6220	2	(6220)		2	6220	
3	6220	3	(6220)		3	6220	
				Actual Average		6220 = 1306 KIPS	CT 6/7/85

(9.8.5.3) CIRCLED

AVERAGE AS FOUND LIFTOFF FOR TENDON 9CB = 1324 KIPS CB 6/11/85

(9.8.6.3) LIFTOFFS	
(9.8.6) Acceptable YES	CB 6/11/85
(9.8.6.1) AALV UBL: Conditional Acceptance N/A Notify Owner N/A	CB 6/11/85
(9.8.6.2) AALV LBL: Unacceptable N/A Detension N/A NCR No. N/A	CB 6/11/85
(9.8.7.1) ADJACENT TENDON LIFTOFF REQUIRED N/A Tendon #1 N/A	
Notify Owner N/A Tendon #2 N/A	CB 6/11/85
(9.8.8.3) RESET SHIM STACK HEIGHT: #1 Stack N/A #2 Stack N/A	CB 6/11/85

(9.8.8.4) NEW ACTUAL LIFTOFF VALUE N/A (9.8.8.5) CIRCLED

Stack #1 - 1	N/A	Stack #2 - 1	N/A	Actual	1	N/A	
2	N/A	2	N/A		2	N/A	
3	N/A	3	N/A		3	N/A	
				Actual Average		N/A	CB 6/11/85

(9.8.10) ADJACENT TENDON LIFTOFF

(9.8.10.3) #1 Accept N/A Unacceptable N/A	
(9.8.10.3) #2 Accept N/A Unacceptable N/A Notify Owner N/A	CB 6/11/85

Q.C. Review [signature] Level II Date 6/24/85

Title QE INSPECTOR

MONITORING OF TENDON FORCE - PROCEDURE SQ 9.0

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Inryco
an Inland Steel company

PROJECT CALLAWAY SURVEILLANCE NO. 1 YEAR 85

TENDON NO. 9AC TENDON END/BUTTRESS NO. SHOP / A UNIT 1

Q.C. Signoff

(9.2) Concrete Temp. 75° F Therm. No. ST-62 Recal Date 4/24/86

(9.4) Amount of Effective Wires (From DS 8.0 - 8.3.7.3) 170

(9.5.1) Ram ID 9364 Recal Date JOB END Ram Area 209.535 K= -2.356
Gauge ID FORNEY #1 Recal Date DAILY Daily Check OK

(9.6) Shim Stack Height #1 15.8 #2 15.8 Ruler ID R.21 Recal Date 4/24/86
TARGET 6210

(9.7.2) Tendon Overstress _____ (Shall not exceed 1602 kips for a 170 wire tendon)
9LL 1110^k LBL 1235^k UBL 1369^k (DO NOT EXCEED 7650 PSI)

(9.8.1.1) Actual Tendon Overstress Value 6600 PSI (Force in kips or Pressure in PSI)

(9.8.5.2) ACTUAL LIFTOFF VALUES

		(9.8.5.3) CIRCLED	
Stack #1 - 1	5900	Stack #2 - 1 (6480)	Actual 1 6480
2	6000	2 (6450)	2 6450
3	5900	3 (6440)	3 6440
		Actual Average	6457 = 1351 KIPS

(9.8.6.3) LIFTOFFS AVERAGE AS FOUND LIFTOFF FOR TENDON 9AC = 1339.5 KIPS

(9.8.6) Acceptable YES

(9.8.6.1) AALV UBL: Conditional Acceptance N/A Notify Owner N/A

(9.8.6.2) AALV LBL: Unacceptable N/A Detension N/A NCR No. N/A

(9.8.7.1) ADJACENT TENDON LIFTOFF REQUIRED N/A Tendon #1 N/A
Notify Owner N/A Tendon #2 N/A

(9.8.8.3) RESET SHIM STACK HEIGHT: #1 Stack N/A #2 Stack N/A

(9.8.8.4) NEW ACTUAL LIFTOFF VALUE N/A (9.8.8.5) CIRCLED

Stack #1 - 1	N/A	Stack #2 - 1	N/A	Actual 1	N/A
2	N/A	2	N/A	2	N/A
3	N/A	3	N/A	3	N/A
				Actual Average	N/A

(9.8.10) ADJACENT TENDON LIFTOFF

(9.8.10.3) #1 Accept N/A Unacceptable N/A
(9.8.10.3) #2 Accept N/A Unacceptable N/A Notify Owner N/A

Q.C. Review [signature] Level II Date 6/26/85

Title Q.E. INSPECTOR

MONITORING OF TENDON FORCE - PROCEDURE SQ 9.0

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Inryco
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PROJECT CALLAWAY SURVEILLANCE NO. 1 YEAR 85

TENDON NO. 9AC TENDON END/BUTTRESS NO. FIELD/BUTT C UNIT 1

	Q.C. Signoff
(9.2) Concrete Temp. 80 F Therm. No. ST-62 Recal Date 4/24/86	
(9.4) Amount of Effective Wires (From DS 8.0 - 8.3.7.3) 170	✓ 6/10/85
(9.5.1) Ram ID 9363 Recal Date JOB END Ram Area 211.687 K= -10.251	✓ 6/10/85
Gauge ID FORNEY #7 Recal Date DAILY Daily Check OK	✓ 6/10/85
(9.6) Shim Stack Height #1 13.50 #2 13.50 Ruler ID R21 Recal Date 4/24/86	✓ 6/10/85
(9.7.2) Tendon Overstress 6200 psi (DO NOT EXCEED 7610 psi) (Shall not exceed 1602 kips for a 170 wire tendon)	✓ 6/10/85
9LL 1110 LBL 1235 UBL 1369	
(9.8.1.1) Actual Tendon Overstress Value 6500 (Force in kips or Pressure in PSI)	✓ 6/10/85

(9.8.5.2) ACTUAL LIFTOFF VALUES

Stack #1 - 1	6060	Stack #2 - 1	(6320)	Actual	1	6320	
2	6020	2	(6320)		2	6320	
3	5990	3	(6320)		3	6320	
				Actual Average		6320 = 1328 KIPS	✓ 6/10/85

(9.8.5.3) CIRCLED

(9.8.6.3) LIFTOFFS AVERAGE AS FOUND LIFTOFF FOR TENDON 9AC = 1339.5 KIPS ✓ 6/24/85

(9.8.6) Acceptable YES	✓ 6/24/85
(9.8.6.1) AALV UBL: Conditional Acceptance N/A Notify Owner N/A	✓ 6/24/85
(9.8.6.2) AALV LBL: Unacceptable N/A Detension N/A NCR No. N/A	✓ 6/24/85
(9.8.7.1) ADJACENT TENDON LIFTOFF REQUIRED N/A Tendon #1 N/A	
Notify Owner N/A Tendon #2 N/A	✓ 6/24/85
(9.8.8.3) RESET SHIM STACK HEIGHT: #1 Stack N/A #2 Stack N/A	✓ 6/24/85

(9.8.8.4) NEW ACTUAL LIFTOFF VALUE N/A (9.8.8.5) CIRCLED

Stack #1 - 1	N/A	Stack #2 - 1	N/A	Actual	1	N/A	
2	N/A	2	N/A		2	N/A	
3	N/A	3	N/A		3	N/A	
				Actual Average		N/A	✓ 6/24/85

(9.8.10) ADJACENT TENDON LIFTOFF

(9.8.10.3) #1 Accept N/A Unacceptable N/A	
(9.8.10.3) #2 Accept N/A Unacceptable N/A Notify Owner N/A	✓ 6/24/85

Q.C. Review _____ Level ____ Date _____

Title _____

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MONITORING OF TENDON FORCE - PROCEDURE SQ 9.0

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Inryco
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PROJECT CALLAWAY SURVEILLANCE NO. 1 YEAR 85

TENDON NO. 26AC TENDON END/BUTTRESS NO. SHOP/BUTT "A" UNIT 1

Q.C. Signoff

(9.2) Concrete Temp. 66 F Therm. No. ST-62 Recal Date 4/24/86

(9.4) Amount of Effective Wires (From DS 8.0 - 8.3.7.3) 170

(9.5.1) Ram ID 9364 Recal Date JOB END Ram Area 209.535 K- -2.356
Gauge ID FORNEY #1 Recal Date DAILY Daily Check OK

(9.6) Shim Stack Height #1 14.50 #2 14.50 Ruler ID R21 Recal Date 4/24/86

(9.7.2) Tendon Overstress 6230 psi TARGET- (DO NOT EXCEED 7650 psi)
(Shall not exceed 1602 kips for a 170 wire tendon)
9LL 1110 LBL 1235 UBL 1369

(9.8.1.1) Actual Tendon Overstress Value 6800 (Force in kips or Pressure in PSI)

(9.8.5.2) ACTUAL LIFTOFF VALUES (9.8.5.3) CIRCLED

	Stack #1	Stack #2	Actual
1	6480	(6480)	6480
2	6480	(6480)	6480
3	6480	(6480)	6480

Actual Average 6480 = 1355 KIPS

(9.8.6.3) LIFTOFFS AVERAGE AS FOUND LIFTOFF FOR TENDON 26AC = 1339 KIPS

(9.8.6) Acceptable YES

(9.8.6.1) AALV UBL: Conditional Acceptance N/A Notify Owner N/A

(9.8.6.2) AALV LBL: Unacceptable N/A Detension N/A NCR No. N/A

(9.8.7.1) ADJACENT TENDON LIFTOFF REQUIRED N/A Tendon #1 N/A
Notify Owner N/A Tendon #2 N/A

(9.8.8.3) RESET SHIM STACK HEIGHT: #1 Stack N/A #2 Stack N/A

(9.8.8.4) NEW ACTUAL LIFTOFF VALUE N/A (9.8.8.5) CIRCLED

	Stack #1	Stack #2	Actual
1	N/A	N/A	N/A
2	N/A	N/A	N/A
3	N/A	N/A	N/A

Actual Average N/A

(9.8.10) ADJACENT TENDON LIFTOFF

(9.8.10.3) #1 Accept N/A Unacceptable N/A
(9.8.10.3) #2 Accept N/A Unacceptable N/A Notify Owner N/A

Q.C. Review _____ Level ____ Date _____

Title _____

MONITORING OF TENDON FORCE - PROCEDURE SQ 9.0

DATA SHEET 9.0 - INSPECTION DOCUMENTATION

Inryco
an Inland Steel company

PROJECT CALLAWAY SURVEILLANCE NO. 1 YEAR 85

TENDON NO. 26AC TENDON END/BUTTRESS NO. FIELD/BUTT "C" UNIT 1

	Q.C. Signoff
(9.2) Concrete Temp. 64 F Therm. No. ST-62 Recal Date 4/24/86	
(9.4) Amount of Effective Wires (From DS 8.0 - 8.3.7.3) 170	6/14/85
(9.5.1) Ram ID 9363 Recal Date JOB END Ram Area 211.687 K= -10.251	6/14/85
Gauge ID FARNEY#7 Recal Date DAILY Daily Check OK	6/14/85
(9.6) Shim Stack Height #1 14.50 #2 14.50 Ruler ID R21 Recal Date 4/24/86	6/14/85
(9.7.2) Tendon Overstress 6200 psi TARGET (DO NOT EXCEED 7610 psi) (Shall not exceed 1602 kips for a 170 wire tendon) 9LL 1110 LBL 1235 UBL 1369	6/14/85
(9.8.1.1) Actual Tendon Overstress Value 6640 (Force in kips or Pressure in PSI)	6/14/85

(9.8.5.2) ACTUAL LIFTOFF VALUES

Stack #1		Stack #2		(9.8.5.3) CIRCLED Actual	
1	6060	1	(6300)	1	6300
2	5960	2	(6300)	2	6300
3	5900	3	(6300)	3	6300

Actual Average 6300 = 1323 KIPS — 6/14/85

(9.8.6.3) LIFTOFFS AVERAGE AS FOUND LIFTOFF FOR TENDON 26AC = 1339 KIPS 6/18/85

(9.8.6) Acceptable YES	6/18/85
(9.8.6.1) AALV UBL: Conditional Acceptance N/A Notify Owner N/A	6/18/85
(9.8.6.2) AALV LBL: Unacceptable N/A Detension N/A NCR No. N/A	6/18/85
(9.8.7.1) ADJACENT TENDON LIFTOFF REQUIRED N/A Tendon #1 N/A	
Notify Owner N/A Tendon #2 N/A	6/18/85
(9.8.8.3) RESET SHIM STACK HEIGHT: #1 Stack N/A #2 Stack N/A	6/18/85

(9.8.8.4) NEW ACTUAL LIFTOFF VALUE N/A (9.8.8.5) CIRCLED

Stack #1		Stack #2		Actual	
1	N/A	1	N/A	1	N/A
2	N/A	2	N/A	2	N/A
3	N/A	3	N/A	3	N/A

Actual Average N/A — 6/18/85

(9.8.10) ADJACENT TENDON LIFTOFF

(9.8.10.3) #1 Accept N/A Unacceptable N/A	
(9.8.10.3) #2 Accept N/A Unacceptable N/A Notify Owner N/A	6/18/85

Q.C. Review _____ Level ___ Date _____

Title _____

MONITORING OF TENDON FORCE - PROCEDURE SQ 9.0

DATA SHEET 9.0 - INSPECTION DOCUMENTATION

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PROJECT CALLAWAY SURVEILLANCE NO. 1 YEAR 85

TENDON NO. 5BA TENDON END/BUTTRESS NO. SHOP/BUTT "B" UNIT 1

	Q.C. Signoff
(9.2) Concrete Temp. 68 F Therm. No. ST-62 Recal Date 4/24/86	
(9.4) Amount of Effective Wires (From DS 8.0 - 8.3.7.3) 170	QB 6/24/85
(9.5.1) Ram ID 9363 Recal Date JOB END Ram Area 211.687 K= -10.251	QB 6/24/85
Gauge ID FORNEY#1 Recal Date DAILY Daily Check OK	QB 6/24/85
(9.6) Shim Stack Height #1 14.05 #2 14.10 Ruler ID R21 Recal Date 4/24/86	QB 6/24/85
(9.7.2) Tendon Overstress 6280 psi TARGET (DO NOT EXCEED 7610 PSI) (Shall not exceed 1602 kips for a 170 wire tendon)	QB 6/24/85
9LL 1127 LBL 1252 UBL 1385	
(9.8.1.1) Actual Tendon Overstress Value 6800 (Force in kips or Pressure in PSI)	QB 6/24/85

(9.8.5.2) ACTUAL LIFTOFF VALUES (9.8.5.3) CIRCLED

Stack #1 - 1	4600	Stack #2 - 1	(6600)	Actual	1	6600	
2	4640	2	(6600)		2	6600	
3	4580	3	(6600)		3	6600	
				Actual Average		6600 = 1387 KIPS	QB 6/24/85

(9.8.6.3) LIFTOFFS AVERAGE AS FOUND LIFTOFF FOR TENDON 5BA = 1357 KIPS QB 6/25/85

(9.8.6) Acceptable YES	QB 6/25/85
(9.8.6.1) AALV UBL: Conditional Acceptance N/A Notify Owner N/A	QB 6/24/85
(9.8.6.2) AALV LBL: Unacceptable N/A Detension N/A NCR No. N/A	QB 6/24/85
(9.8.7.1) ADJACENT TENDON LIFTOFF REQUIRED N/A Tendon #1 N/A	
Notify Owner N/A Tendon #2 N/A	QB 6/25/85
(9.8.8.3) RESET SHIM STACK HEIGHT: #1 Stack N/A #2 Stack N/A	QB 6/25/85

(9.8.8.4) NEW ACTUAL LIFTOFF VALUE N/A (9.8.8.5) CIRCLED

Stack #1 - 1	N/A	Stack #2 - 1	N/A	Actual	1	N/A	
2	N/A	2	N/A		2	N/A	
3	N/A	3	N/A		3	N/A	
				Actual Average		N/A	QB 6/25/85

(9.8.10) ADJACENT TENDON LIFTOFF

(9.8.10.3) #1 Accept N/A Unacceptable N/A	
(9.8.10.3) #2 Accept N/A Unacceptable N/A Notify Owner N/A	QB 6/25/85

Q.C. Review _____ Level ____ Date _____

Title _____

MONITORING OF TENDON FORCE - PROCEDURE SQ 9.0

DATA SHEET 9.0 - INSPECTION DOCUMENTATION

Inryco
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PROJECT CALLAWAY SURVEILLANCE NO. 1 YEAR 85

TENDON NO. 5BA TENDON END/BUTTRESS NO. FIELD/BUTT "A" UNIT 1

Q.C. Signoff

(9.2) Concrete Temp. 74 F Therm. No. ST-62 Recal Date 4/24/86

(9.4) Amount of Effective Wires (From DS 8.0 - 8.3.7.3) 170

(9.5.1) Ram ID 9364 Recal Date JOB END Ram Area 209.535 K= -2.356
Gauge ID FORNEY#1 Recal Date DAILY Daily Check OK

(9.6) Shim Stack Height #1 13.80 #2 13.80 Ruler ID R21 Recal Date 4/24/86

(9.7.2) Tendon Overstress 6300 PSI TARGET (DO NOT EXCEED 7650 PSI) (Shall not exceed 1602 kips for a 170 wire tendon)
9LL 1127 LBL 1252 UBL 1385

(9.8.1.1) Actual Tendon Overstress Value 6760 (Force in kips or Pressure in PSI)

(9.8.5.2) ACTUAL LIFTOFF VALUES

		(9.8.5.3) CIRCLED	
Stack #1 - 1	6360	Stack #2 - 1 (6360)	Actual 1 6360
2	6340	2 (6340)	2 6340
3	6300	3 (6340)	3 6340

Actual Average 6346 = 1327 KIPS

AVERAGE AS FOUND LIFTOFF FOR TENDON 5BA = 1357 KIPS

(9.8.6.3) LIFTOFFS

(9.8.6) Acceptable YES

(9.8.6.1) AALV UBL: Conditional Acceptance N/A Notify Owner N/A

(9.8.6.2) AALV LBL: Unacceptable N/A Detension N/A NCR No. N/A

(9.8.7.1) ADJACENT TENDON LIFTOFF REQUIRED N/A Tendon #1 N/A
Notify Owner N/A Tendon #2 N/A

(9.8.8.3) RESET SHIM STACK HEIGHT: #1 Stack N/A #2 Stack N/A

(9.8.8.4) NEW ACTUAL LIFTOFF VALUE N/A (9.8.8.5) CIRCLED

Stack #1 - 1	N/A	Stack #2 - 1	N/A	Actual 1	N/A
2	N/A	2	N/A	2	N/A
3	N/A	3	N/A	3	N/A

Actual Average N/A

(9.8.10) ADJACENT TENDON LIFTOFF

(9.8.10.3) #1 Accept N/A Unacceptable N/A
(9.8.10.3) #2 Accept N/A Unacceptable N/A Notify Owner N/A

Q.C. Review _____ Level ____ Date _____

Title _____

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MONITORING OF TENDON FORCE - PROCEDURE SQ 9.0

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PROJECT CALLAWAY SURVEILLANCE NO. 1 YEAR 85

TENDON NO. 458A TENDON END/BUTTRESS NO. SHOP/BUTT "B" UNIT 1

Q.C. Signoff

(9.2) Concrete Temp. 66 F Therm. No. ST-62 Recal Date 4/24/86

(9.4) Amount of Effective Wires (From DS 8.0 - 8.3.7.3) 170 06/13/85

(9.5.1) Ram ID 9364 Recal Date JOB END Ram Area 209.535 K= -2.356 06/13/85
Gauge ID FORNEY #7 Recal Date DAILY Daily Check OK 06/13/85

(9.6) Shim Stack Height #1 14.35 #2 14.40 Ruler ID R21 Recal Date 4/24/86 06/13/85

(9.7.2) Tendon Overstress 6390 psi TARGET (Shall not exceed 1602 kips for a 170 wire tendon) 06/13/85
9LL 1146 LBL 1270 UBL 1402 DO NOT EXCEED 7560psi (BASED ON 168 WIRES)

(9.8.1.1) Actual Tendon Overstress Value 6240 (Force in kips or Pressure in PSI) 06/13/85

(9.8.5.2) ACTUAL LIFTOFF VALUES (9.8.5.3) CIRCLED

	Stack #1	Stack #2	Actual
1	5820	(6140)	6140
2	5640	(6140)	6140
3	5640	(6140)	6140

Actual Average 6140 = 1284 KIPS 06/13/85

(9.8.6.3) LIFTOFFS AVERAGE AS FOUND LIFTOFF FOR TENDON 458A = 1312.5 KIPS 06/24/85

(9.8.6) Acceptable YES 06/24/85

(9.8.6.1) AALV UBL: Conditional Acceptance N/A Notify Owner N/A 06/24/85

(9.8.6.2) AALV LBL: Unacceptable N/A Detension N/A NCR No. N/A 06/24/85

(9.8.7.1) ADJACENT TENDON LIFTOFF REQUIRED N/A Tendon #1 N/A
Notify Owner N/A Tendon #2 N/A 06/24/85

(9.8.8.3) RESET SHIM STACK HEIGHT: #1 Stack N/A #2 Stack N/A 06/24/85

(9.8.8.4) NEW ACTUAL LIFTOFF VALUE N/A (9.8.8.5) CIRCLED

	Stack #1	Stack #2	Actual
1	N/A	N/A	N/A
2	N/A	N/A	N/A
3	N/A	N/A	N/A

Actual Average N/A 06/24/85

(9.8.10) ADJACENT TENDON LIFTOFF

(9.8.10.3) #1 Accept N/A Unacceptable N/A
(9.8.10.3) #2 Accept N/A Unacceptable N/A Notify Owner N/A 06/24/85

Q.C. Review _____ Level ____ Date _____

Title _____

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MONITORING OF TENDON FORCE - PROCEDURE SQ 9.0

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PROJECT CALLAWAY SURVEILLANCE NO. 1 YEAR 85

TENDON NO. 45BA TENDON END/BUTTRESS NO. Field / A UNIT 1

Q.C. Signoff

(9.2) Concrete Temp. 76° F Therm. No. 57-62 Recal Date 4/24/86

(9.4) Amount of Effective Wires (From DS 8.0 - 8.3.7.3) 168

(9.5.1) Ram ID 9364 Recal Date JOB END Ram Area 209.535 K= - 2.356
Gauge ID Forney #1 Recal Date DAILY Daily Check OK

(9.6) Shim Stack Height #1 14.4" #2 14.4 Ruler ID R17 Recal Date 4/24/85

(9.7.2) Tendon Overstress 6390 P.S.I. TARGET (Shall not exceed 1602 kips for a 170 wire tendon)
9LL 1146" LBL 1270" UBL 1402" DO NOT EXCEED 7560 PSI (BASED ON 168 WIRES)

(9.8.1.1) Actual Tendon Overstress Value 6600 PSI (Force in kips or Pressure in PSI)

(9.8.5.2) ACTUAL LIFTOFF VALUES (9.8.5.3) CIRCLED

	Stack #1	Stack #2	Actual
1	6420	(6420)	6420
2	6390	(6400)	6400
3	6400	(6410)	6410
Actual Average			6410 = 1341 KIPS

AVERAGE AS FOUND LIFTOFF FOR TENDON 45BA = 1312.5 KIPS CB 6/24/85 CB 6/24/85

(9.8.6.3) LIFTOFFS

(9.8.6) Acceptable YES

(9.8.6.1) AALV UBL: Conditional Acceptance N/A Notify Owner N/A

(9.8.6.2) AALV LBL: Unacceptable N/A Detension N/A NCR No. N/A

(9.8.7.1) ADJACENT TENDON LIFTOFF REQUIRED N/A Tendon #1 N/A
Notify Owner N/A Tendon #2 N/A

(9.8.8.3) RESET SHIM STACK HEIGHT: #1 Stack N/A #2 Stack N/A

(9.8.8.4) NEW ACTUAL LIFTOFF VALUE N/A (9.8.8.5) CIRCLED

	Stack #1	Stack #2	Actual
1	N/A	N/A	N/A
2	N/A	N/A	N/A
3	N/A	N/A	N/A
Actual Average			N/A

(9.8.10) ADJACENT TENDON LIFTOFF

(9.8.10.3) #1 Accept N/A Unacceptable N/A
(9.8.10.3) #2 Accept N/A Unacceptable N/A Notify Owner N/A

Q.C. Review [signature] Level II Date 6/26/85

Title Q.E. INSPECTOR

MONITORING OF TENDON FORCE - PROCEDURE SQ 9.0

DATA SHEET 9.0 - INSPECTION DOCUMENTATION

Inryco
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PROJECT CALLAWAY SURVEILLANCE NO. 1 YEAR 85

TENDON NO. 51BA TENDON END/BUTTRESS NO. SHOP/BUTT "B" UNIT 1

	Q.C. Signoff
(9.2) Concrete Temp. 74 F Therm. No. ST-62 Recal Date 4/24/86	
(9.4) Amount of Effective Wires (From DS 8.0 - 8.3.7.3) 170	MS 6/14/85
(9.5.1) Ram ID 9364 Recal Date JOB END Ram Area 209.535 K= -2.356	MS 6/14/85
Gauge ID FORNEY #7 Recal Date DAILY Daily Check OK	MS 6/14/85
(9.6) Shim Stack Height #1 12.95 #2 12.95 Ruler ID R21 Recal Date 4/24/86	MS 6/14/85
(9.7.2) Tendon Overstress 6000 PSI TARGET (DO NOT EXCEED 7650 PSI) (Shall not exceed 1602 kips for a 170 wire tendon)	MS 6/14/85
9LL 1076 LBL 1193 UBL 1318	
(9.8.1.1) Actual Tendon Overstress Value 6200 (Force in kips or Pressure in PSI)	MS 6/14/85

(9.8.5.2) ACTUAL LIFTOFF VALUES

Stack #1 - 1	5860	Stack #2 - 1	(6100)	Actual 1	6100	
2	5920	2	(6100)	2	6100	
3	5960	3	(6100)	3	6100	
				Actual Average	6100 = 1276 KIPS	MS 6/14/85

(9.8.5.3) CIRCLED

AVERAGE AS FOUND LIFTOFF FOR TENDON 51BA = 1283.5 KIPS MS 6/24/85

(9.8.6.3) LIFTOFFS	
(9.8.6) Acceptable YES	MS 6/24/85
(9.8.6.1) AALV UBL: Conditional Acceptance N/A Notify Owner N/A	MS 6/24/85
(9.8.6.2) AALV LBL: Unacceptable N/A Detension N/A NCR No. N/A	MS 6/24/85
(9.8.7.1) ADJACENT TENDON LIFTOFF REQUIRED N/A Tendon #1 N/A	
Notify Owner N/A Tendon #2 N/A	MS 6/24/85
(9.8.8.3) RESET SHIM STACK HEIGHT: #1 Stack N/A #2 Stack N/A	MS 6/24/85

(9.8.8.4) NEW ACTUAL LIFTOFF VALUE N/A (9.8.8.5) CIRCLED

Stack #1 - 1	N/A	Stack #2 - 1	N/A	Actual 1	N/A	
2	N/A	2	N/A	2	N/A	
3	N/A	3	N/A	3	N/A	
				Actual Average	N/A	MS 6/24/85

(9.8.10) ADJACENT TENDON LIFTOFF

(9.8.10.3) #1 Accept N/A Unacceptable N/A	
(9.8.10.3) #2 Accept N/A Unacceptable N/A Notify Owner N/A	MS 6/24/85

Q.C. Review _____ Level ____ Date _____

Title _____

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MONITORING OF TENDON FORCE - PROCEDURE SQ 9.0

DATA SHEET 9.0 - INSPECTION DOCUMENTATION

Inryco
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PROJECT CALLAWAY SURVEILLANCE NO. 1 YEAR 85

TENDON NO. 51BA TENDON END/BUTTRESS NO. FIELD/BUTT "A" UNIT 1

	Q.C. Signoff
(9.2) Concrete Temp. 84 F Therm. No. ST-62 Recal Date 4/24/86	
(9.4) Amount of Effective Wires (From DS 8.0 - 8.3.7.3) 170	
(9.5.1) Ram ID 9364 Recal Date JOB END Ram Area 209.535 K= -2.356	
Gauge ID FORNEY #1 Recal Date DAILY Daily Check OK	
(9.6) Shim Stack Height #1 12.80 #2 12.80 Ruler ID R21 Recal Date 4/24/86	
(9.7.2) Tendon Overstress 6000 PSI TARGET (DO NOT EXCEED 7650 PSI) (Shall not exceed 1602 kips for a 170 wire tendon)	
9LL 1076 LBL 1193 UBL 1318	
(9.8.1.1) Actual Tendon Overstress Value 6480 (Force in kips or Pressure in PSI)	

(9.8.5.2) ACTUAL LIFTOFF VALUES

(9.8.5.3) CIRCLED

	Stack #1	Stack #2	Actual
1	6120	(6160)	6160
2	6140	(6180)	6180
3	6140	(6180)	6180

Actual Average 6173 = 1291 KIPS

AVERAGE AS FOUND LIFTOFF FOR TENDON 51BA = 1283.5 KIPS

(9.8.6.3) LIFTOFFS

(9.8.6) Acceptable YES	
(9.8.6.1) AALV UBL: Conditional Acceptance N/A Notify Owner N/A	
(9.8.6.2) AALV LBL: Unacceptable N/A Detension N/A NCR No. N/A	
(9.8.7.1) ADJACENT TENDON LIFTOFF REQUIRED N/A Tendon #1 N/A	
Notify Owner N/A Tendon #2 N/A	
(9.8.8.3) RESET SHIM STACK HEIGHT: #1 Stack N/A #2 Stack N/A	
(9.8.8.4) NEW ACTUAL LIFTOFF VALUE N/A (9.8.8.5) CIRCLED	

	Stack #1	Stack #2	Actual
1	N/A	N/A	N/A
2	N/A	N/A	N/A
3	N/A	N/A	N/A

Actual Average N/A

(9.8.10) ADJACENT TENDON LIFTOFF

(9.8.10.3) #1 Accept N/A Unacceptable N/A

(9.8.10.3) #2 Accept N/A Unacceptable N/A Notify Owner N/A

Q.C. Review _____ Level ____ Date _____

Title _____

Effective Date:	1-07-85	Previous Revision: △	Revision: △	Page 1 of 1

TENDON TEST WIRE REMOVAL PROCEDURE SQ 10.2

DATA SHEET 10.2 - INSPECTION DOCUMENTATION

Inryco
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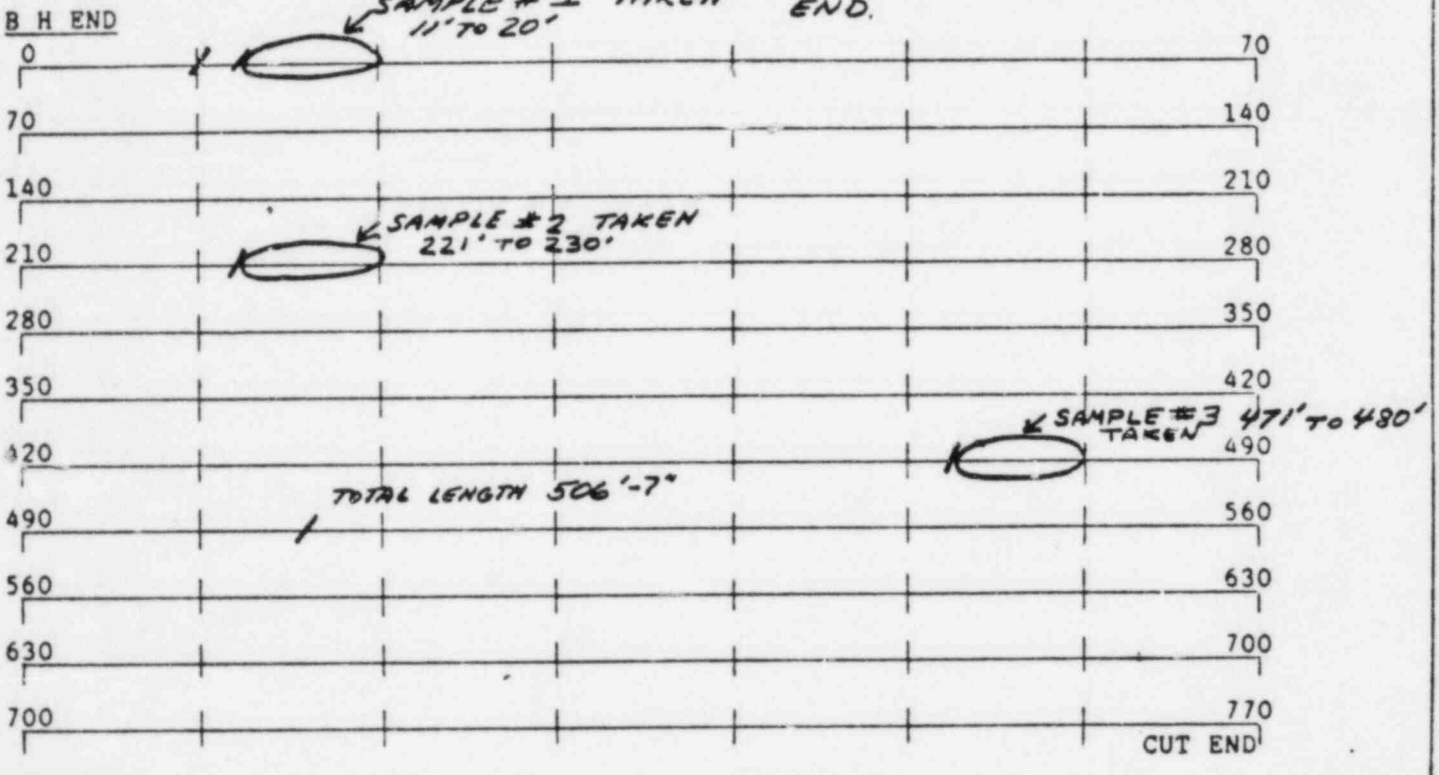
PROJECT CALLAWAY SURVEILLANCE NO. 1 YEAR 85
290° AZIMUTH ~~5/31/85~~ 5/31/85

TENDON NO. V74 TENDON END/BUTTRESS NO. FIELD UNIT 1

DATE OF REMOVAL 5/28+29/85 DATE OF INSPECTION 5-29-85

INSPECTED BY [signature] (7.5.4.3.1) LENGTH OF WIRE 506'-7"

BUTTONHEAD CUT ON THE SHOP END. WIRE PULLED FROM FIELD END.



Remember to add the 1 inch for the marked line to the length of the wire.
If the samples are removed, mark the location of removal here and on DS 10.3.

Measuring Device RULER I.D. R21 Recal Date 4/24/86
Wire Pulling Ram I.D. N/A Recal Date N/A

CORROSION CONDITION (Refer SQ 8.1) ALL WIRE CORROSION CONDITION "A"

A = EXCELLENT)
B = GOOD)
C = FAIR) Document the Corrosion Condition for each
D = USABLE) 10 foot segment.
E = REJECTED (Pitted))

(7.1) Post the location of wire removal to DS 8.0 OK ~~5/30/85~~ 6/4/85

Q.C. Review _____ Level ___ Date _____

Title _____

TENDON TEST WIRE REMOVAL PROCEDURE SQ 10.2

DATA SHEET 10.2 - INSPECTION DOCUMENTATION

Inryco
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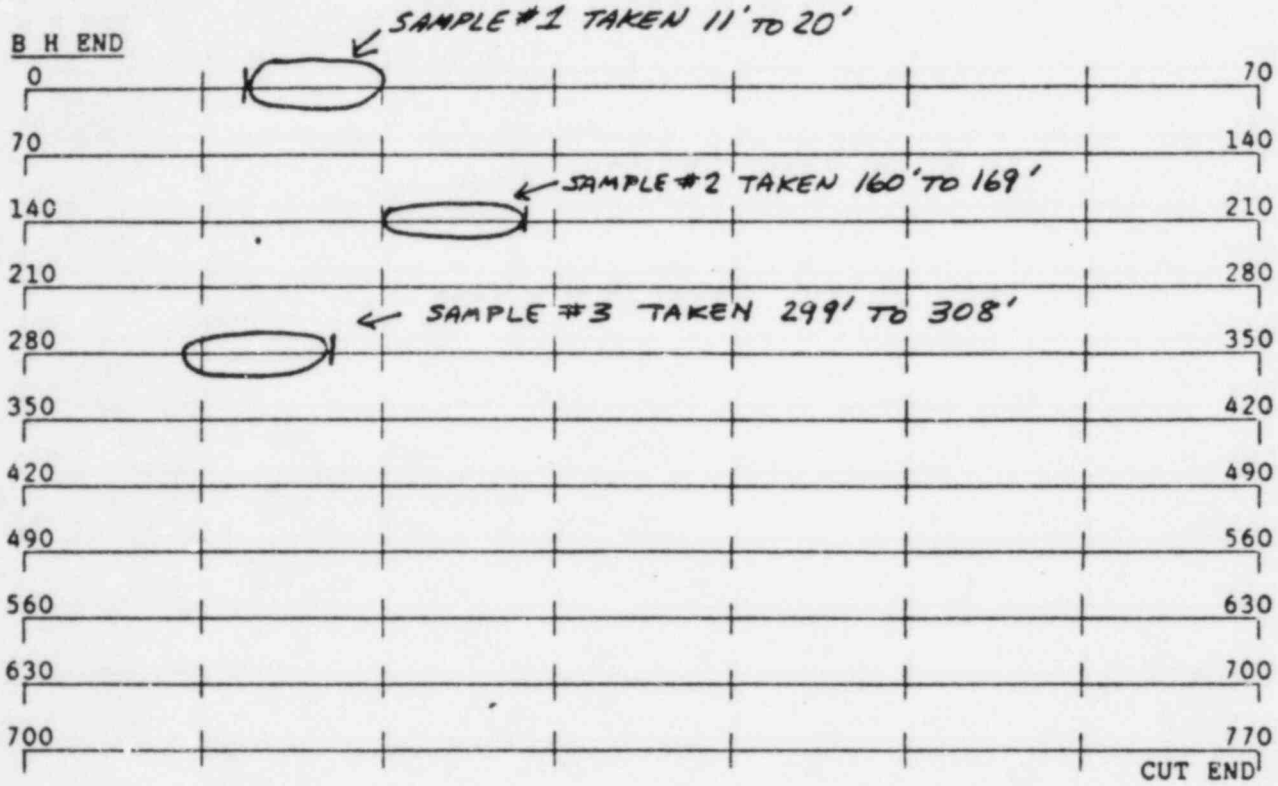
PROJECT CALLAWAY SURVEILLANCE NO. 1 YEAR 85

TENDON NO. 26AC TENDON END/BUTTRESS NO. FIELD/BUTT "C" UNIT 1

DATE OF REMOVAL 6/18+19/85 DATE OF INSPECTION 6/18+19/85

INSPECTED BY C. K. Lindsey (7.5.4.3.1) LENGTH OF WIRE 308'-1½"



Remember to add the 1 inch for the marked line to the length of the wire.
If the samples are removed, mark the location of removal here and on DS 10.3.

Measuring Device RULER I.D. R17 Recal Date 4/24/86
Wire Pulling Ram I.D. N/A Recal Date N/A

CORROSION CONDITION (Refer SQ 8.1)
A = EXCELLENT)
B = GOOD)
C = FAIR) Document the Corrosion Condition for each
D = USABLE) 10 foot segment.
E = REJECTED (Pitted))

ALL WIRE CORROSION CONDITION "A"

(7.1) Post the location of wire removal to DS 8.0 OK ✓

Q.C. Review [signature] Level II Date 6/26/85

Title Q.E. INSPECTOR

PHYSICAL TESTING - TENDON WIRES PROCEDURE SQ 10.3

DATA SHEET 10.3 - INSPECTION DOCUMENTATION

Inryco
an Inland Steel company

PROJECT CALLAWAY SURVEILLANCE NO. 1 YEAR 85

TENDON NO. V74 TENDON END/BUTTRESS NO. FIELD/BUTT-N/A 290° AZIMUTH CB 6/14/85 UNIT 1

Q.C. SIGNOFF [signature] TITLE Q.E. INSPECTOR DATE 6/27/85

(7.1.1) Wire ID and Location of removal SAMPLE #1 Length 108"

(7.2.1) Wire Diameters: Tag End .249 Middle .249 Ram End .249 Avg. .249
Measuring Device ID QC.13 Recal Date 10/24/85

(7.3.2.1) Buttonhead Inspection Tag End OK Ram End OK

(7.4.1) Gauge Length of Wire 100" Measuring Device ID R21 Recal Date 4/24/86

(7.6.1) Preload force or pressure 1550 Pressure Gauge ID FORNEY #1 Recal Date DAILY

(7.7.1) Force reduced to 0 OK

(7.8.1) Initial load of wire in force or pressure 900 (0.1% elongation)

(7.9.1) Preset Dial Indicator OK (0.9% elongation) Indicator ID ECC21 Recal Date 1/16/86

(7.10.1) Force or pressure at 1% elongation 7070

(7.11.1) "Rule" reading measurement at 1% elongation 7.9

(7.12.1) Maximum elongation at failure, from "Rule" reading 9.6

(7.12.2) Maximum force or pressure at failure 7660

(7.13.1) Type of break DUCTILE Location of break 99" FROM TAGGED END (SHOP END)

(7.14) CALCULATIONS:

(1) Ultimate Stress 245,508 Max.Force ÷ (π Diam.^{2} ÷ 4)

(2) Yield Stress at 1% elongation 226,633 Force @ 1% ÷ (π Diam.^{2} ÷ 4)

(3) Percent elongation at failure 2.7% 1 +("Rule"Dim @ Failure -"Rule"Dim @ 1%)

(8) Sample: Accept ✓ Unacceptable ____ Engr. Notified ____

Q.C. Review ____ Level ____ Date ____

Title ____

PHYSICAL TESTING - TENDON WIRES PROCEDURE SQ 10.3

DATA SHEET 10.3 - INSPECTION DOCUMENTATION

Inryco
an Inland Steel company

PROJECT CALLAWAY SURVEILLANCE NO. 1 YEAR 85

TENDON NO. V74 TENDON END/BUTTRESS NO. FIELD/290° AZIMUTH UNIT 1

Q.C. SIGNOFF [signature] TITLE Q.E. INSPECTOR DATE 6/27/85

(7.1.1) Wire ID and Location of removal SAMPLE #2 Length 108.1"

(7.2.1) Wire Diameters: Tag End .249 Middle .249 Ram End .249 Avg. .249
Measuring Device ID Q.C. 13 Recal Date 10/24/85

(7.3.2.1) Buttonhead Inspection Tag End OK Ram End OK

(7.4.1) Gauge Length of Wire 100" Measuring Device ID R21 Recal Date 4/24/86

(7.6.1) Preload force or pressure 1550 Pressure Gauge ID FORNEY #1 Recal Date DAILY

(7.7.1) Force reduced to 0 OK

(7.8.1) Initial load of wire in force or pressure 900 (0.1% elongation)

(7.9.1) Preset Dial Indicator OK (0.9% elongation) Indicator ID EEX21 Recal Date 1/16/86

(7.10.1) Force or pressure at 1% elongation 7120

(7.11.1) "Rule" reading measurement at 1% elongation 8.0

(7.12.1) Maximum elongation at failure, from "Rule" reading 10.5

(7.12.2) Maximum force or pressure at failure 7680

(7.13.1) Type of break DUCTILE Location of break 13" FROM TAGGED END (SHOP END)

(7.14) CALCULATIONS:

(1) Ultimate Stress 246,148 Max.Force ÷ (π Diam.^{2} ÷ 4)

(2) Yield Stress at 1% elongation 228,233 Force @ 1% ÷ (π Diam.^{2} ÷ 4)

(3) Percent elongation at failure 3% 1 +("Rule"Dim @ Failure -"Rule"Dim @ 1%)

(8) Sample: Accept ✓ Unacceptable ____ Engr. Notified ____

Q.C. Review ____ Level ____ Date ____

Title ____

PHYSICAL TESTING - TENDON WIRES PROCEDURE SQ 10.3

DATA SHEET 10.3 - INSPECTION DOCUMENTATION

Inryco
an Inland Steel company

PROJECT CALLAWAY SURVEILLANCE NO. 1 YEAR 85

TENDON NO. V74 TENDON END/BUTTRESS NO. FIELD/290° Az. UNIT 1

Q.C. SIGNOFF [signature] TITLE Q.E. INSPECTOR DATE 6/14/85

(7.1.1) Wire ID and Location of removal SAMPLE #3 Length 108.1"

(7.2.1) Wire Diameters: Tag End .249 Middle .249 Ram End .249 Avg. .249
Measuring Device ID Q.C.13 Recal Date ~~4/24/85~~ 10/24/85 @ 6/14/85

(7.3.2.1) Buttonhead Inspection Tag End OK Ram End OK

(7.4.1) Gauge Length of Wire 100" Measuring Device ID R21 Recal Date 4/24/85

(7.6.1) Preload force or pressure 1550 Pressure Gauge ID FORNEY#7 Recal Date DAILY

(7.7.1) Force reduced to 0 OK

(7.8.1) Initial load of wire in force or pressure 900 (0.1% elongation)

(7.9.1) Preset Dial Indicator OK (0.9% elongation) Indicator ID EQC21 Recal Date 1/16/85

(7.10.1) Force or pressure at 1% elongation 7150

(7.11.1) "Rule" reading measurement at 1% elongation 6.8"

(7.12.1) Maximum elongation at failure, from "Rule" reading 9.9"

(7.12.2) Maximum force or pressure at failure 7860

(7.13.1) Type of break DUCTILE Location of break 65" FROM TAGGED END (FIELD END)

(7.14) CALCULATIONS:

(1) Ultimate Stress 251,907 Max.Force ÷ (π Diam.^{2} ÷ 4)

(2) Yield Stress at 1% elong on 229,193 Force @ 1% ÷ (π Diam.^{2} ÷ 4)

(3) Percent elongation at failure 4.1 1 +("Rule"Dim @ Failure -"Rule"Dim @ 1%)

(8) Sample: Accept ✓ Unacceptable ____ Engr. Notified ____

Q.C. Review ____ Level ____ Date ____

Title ____

PHYSICAL TESTING - TENDON WIRES PROCEDURE SQ 10.3

DATA SHEET 10.3 - INSPECTION DOCUMENTATION

Inryco
an Inland Steel company

PROJECT CALLAWAY SURVEILLANCE NO. 1 YEAR 85

TENDON NO. 26AC TENDON END/BUTTRESS NO. FIELD/BUTT "C" UNIT 1

Q.C. SIGNOFF [signature] TITLE Q.E. INSPECTOR DATE 6/27/85

(7.1.1) Wire ID and Location of removal SAMPLE #1 Length 108"

(7.2.1) Wire Diameters: Tag End .250 Middle .250 Ram End .250 Avg. .250
Measuring Device ID Q.C.13 Recal Date 10/24/85

(7.3.2.1) Buttonhead Inspection Tag End OK Ram End OK

(7.4.1) Gauge Length of Wire 100" Measuring Device ID R21 Recal Date 4/24/86

(7.6.1) Preload force or pressure 1550 Pressure Gauge ID FORNEY #1 Recal Date DAILY

(7.7.1) Force reduced to 0 OK

(7.8.1) Initial load of wire in force or pressure 900 (0.1% elongation)

(7.9.1) Preset Dial Indicator OK (0.9% elongation) Indicator ID ECC 21 Recal Date 1/6/86

(7.10.1) Force or pressure at 1% elongation 7490

(7.11.1) "Rule" reading measurement at 1% elongation 8.0

(7.12.1) Maximum elongation at failure, from "Rule" reading 11.5

(7.12.2) Maximum force or pressure at failure 8330

(7.13.1) Type of break DUCTILE Location of break 39½" FROM TAGGED END (FIELD END)

(7.14) CALCULATIONS:

(1) Ultimate Stress 264,822 Max. Force ÷ (π Diam.^{2} ÷ 4)

(2) Yield Stress at 1% elongation 238,162 Force @ 1% ÷ (π Diam.^{2} ÷ 4)

(3) Percent elongation at failure 4.5% 1 + ("Rule" Dim @ Failure - "Rule" Dim @ 1%)

(8) Sample: Accept ✓ Unacceptable ____ Engr. Notified ____

Q.C. Review ____ Level ____ Date ____

Title ____

PHYSICAL TESTING - TENDON WIRES PROCEDURE SQ 10.3

DATA SHEET 10.3 - INSPECTION DOCUMENTATION

Inryco
an Inland Steel company

PROJECT CALLAWAY SURVEILLANCE NO. 1 YEAR 85

TENDON NO. 26AC TENDON END/BUTTRESS NO. FIELD/BUTT "C" UNIT 1

Q.C. SIGNOFF [signature] TITLE Q.E. INSPECTOR DATE 6/27/85

(7.1.1) Wire ID and Location of removal SAMPLE #2 Length 108 1/4"

(7.2.1) Wire Diameters: Tag End .250 Middle .250 Ram End .250 Avg. .250
Measuring Device ID Q.C. 13 Recal Date 10/24/85

(7.3.2.1) Buttonhead Inspection Tag End OK Ram End OK

(7.4.1) Gauge Length of Wire 100" Measuring Device ID R21 Recal Date 4/24/86

(7.6.1) Preload force or pressure 1550 Pressure Gauge ID FORNEY#1 Recal Date DAILY

(7.7.1) Force reduced to 0 OK

(7.8.1) Initial load of wire in force or pressure 900 (0.1% elongation)

(7.9.1) Preset Dial Indicator OK (0.9% elongation) Indicator ID ECC 21 Recal Date 1/16/86

(7.10.1) Force or pressure at 1% elongation 7490

(7.11.1) "Rule" reading measurement at 1% elongation 7.9

(7.12.1) Maximum elongation at failure, from "Rule" reading 10.6

(7.12.2) Maximum force or pressure at failure 8160

(7.13.1) Type of break DUCTILE Location of break 1/4" FROM SHOP END OPPOSITE TAGGED END.

(7.14) CALCULATIONS:

(1) Ultimate Stress 259,427 Max.Force ÷ (π Diam.^{2} ÷ 4)

(2) Yield Stress at 1% elongation 238,162 Force @ 1% ÷ (π Diam.^{2} ÷ 4)

(3) Percent elongation at failure 37% 1 +("Rule"Dim @ Failure -"Rule"Dim @ 1%)

(8) Sample: Accept ✓ Unacceptable ____ Engr. Notified ____

Q.C. Review ____ Level ____ Date ____

Title ____

PHYSICAL TESTING - TENDON WIRES PROCEDURE SQ 10.3

DATA SHEET 10.3 - INSPECTION DOCUMENTATION

Inryco
an Inland Steel company

PROJECT CALLAWAY SURVEILLANCE NO. 1 YEAR 85

TENDON NO. 26AC TENDON END/BUTTRESS NO. FIELD/BUTT "C" UNIT 1

Q.C. SIGNOFF [signature] TITLE Q.E. INSPECTOR DATE 6/27/85

(7.1.1) Wire ID and Location of removal SAMPLE #3 Length 107.8"

(7.2.1) Wire Diameters: Tag End .250 Middle .250 Ram End .250 Avg. .250
Measuring Device ID R21 Q.C. 13 EB 6/27/85 Recal Date 7/84 10/24/85 EB 6/27/85

(7.3.2.1) Buttonhead Inspection Tag End OK Ram End OK

(7.4.1) Gauge Length of Wire 100" Measuring Device ID R21 Recal Date 4/24/86

(7.6.1) Preload force or pressure 1550 Pressure Gauge ID FORNEY #1 Recal Date DAILY

(7.7.1) Force reduced to 0 OK

(7.8.1) Initial load of wire in force or pressure 900 (0.1% elongation)

(7.9.1) Preset Dial Indicator OK (0.9% elongation) Indicator ID EQC21 Recal Date 1/16/86

(7.10.1) Force or pressure at 1% elongation 7480

(7.11.1) "Rule" reading measurement at 1% elongation 7.9

(7.12.1) Maximum elongation at failure, from "Rule" reading 10.2

(7.12.2) Maximum force or pressure at failure 7980

(7.13.1) Type of break DUCTILE Location of break 1/8" FROM TAGGED END (FIELD END)

(7.14) CALCULATIONS:

(1) Ultimate Stress 253,714 Max.Force ÷ (π Diam.^{2} ÷ 4)

(2) Yield Stress at 1% elongation 237,845 Force @ 1% ÷ (π Diam.^{2} ÷ 4)

(3) Percent elongation at failure 33% 1 +("Rule"Dim @ Failure -"Rule"Dim @ 1%)

(8) Sample: Accept ✓ Unacceptable ____ Engr. Notified ____

Q.C. Review ____ Level ____ Date ____

Title ____

Attach. 4

GREASE SAMPLE ANALYSIS

SAMPLE I.D.	CHLORIDES (2)*	NITRATES (4)*	SULFIDES (2)*	WATER % (10)**	NEUTRALIZATION NO.
1) V20-Shop	0.05	0.38	0.015	0.26	61.18
2) V20-Field	0.13	0.20	0.044	0.25	60.52
3) V35-Shop	0.05	0.47	0.025	0.19	58.92
4) V35-Field	0.20	0.28	0.018	0.25	57.82
5) V65-Shop	0.13	0.25	0.030	0.29	63.51
6) V65-Field	0.05	0.15	0.018	0.24	63.79
7) V74-Shop	0.20	0.15	0.030	0.19	50.21
8) V74-Field	0.20	0.15	0.030	0.05	50.20
9) H01-CB-Shop	0.20	0.47	0.018	0.19	56.96
10) H01-CB-Field	0.20	0.35	0.015	0.23	58.35
11) H09-CB-Shop	0.13	0.35	0.015	0.24	56.92
12) H09-CB-Field	0.13	0.15	0.005	0.23	55.02
13) H09-AC-Shop	0.13	0.20	0.005	0.29	60.86
14) H09-AC-Field	0.13	0.15	0.010	0.25	61.52
15) H26-AC-Shop	0.20	0.10	0.015	0.18	56.90
16) H26-AC-Field	0.13	0.25	0.005	0.09	55.90
17) H05-BA-Shop	0.13	0.15	0.010	0.09	57.36
18) H05-BA-Field	0.05	0.25	0.005	0.20	56.82
19) H45-BA-Shop	0.13	0.40	0.010	0.18	52.11
20) H45-BA-Field	0.20	0.15	0.010	0.19	52.60
21) H51-BA-Shop	0.13	0.35	0.070	0.18	53.39
22) H51-BA-Field	0.05	0.15	0.010	0.17	53.30

* Maximum allowable limit, parts per million.

** Maximum allowable limit, percent of dry weight of the filler material.