

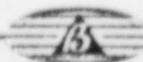
ARMS

INDEXED

BROWN & ROOT, INC. CPSES JOB 35-1195	PROCEDURE NUMBER CPM 13.1	REVISION 7	EFFECTIVE DATE DATE 12/9/81	PAGE 1 of 10
TITLE: GENERAL CALIBRATION PROCEDURE (ASME RELATED PROCEDURE)	ORIGINATOR: <u>[Signature]</u> 12/8/81 DATE REVIEWED BY: <u>Nasir [Signature]</u> 12/8/81 GGR QA DATE <u>[Signature]</u> 12/8/81 TUGED QA DATE APPROVED BY <u>DC [Signature]</u> 12-9-81 CONSTRUCTION PROJECT MANAGER DATE			

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**FOR OFFICE AND
ENGINEERING USE ONLY**



JOB 35-1195
Comanche Peak Steam Electric Station

Sheet 1 of 3

Construction Procedure
DOCUMENT CHANGE NOTICE NUMBER 5

This notice applies to Construction Procedure No. 35-1195- CPM 13.1 Revision 7.
This change will be incorporated in the next revision of the procedure.

Change the procedure as follows:

Replace the following page with the attached .

Page 8 of 10

Add the following page

* Page 8a of 10

Reviewed by:

[Signature] 3-4-83
Originator Date

[Signature] 3/14/83
Brown & Root Quality Assurance Date

Reviewed by:

[Signature] 3/30/83
TUGCO Quality Assurance Date

Approved by:

[Signature] 3-31-83
Construction Project Manager Date

April 4, 1983

Effective Date



JOB 35-1195
Comanche Peak Steam Electric Station

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Construction Procedure
DOCUMENT CHANGE NOTICE NUMBER 4

This notice applies to Construction Procedure No. 35-1195-CPM 13.1 Revision 7.

This change will be incorporated in the next revision of the procedure.

Change the procedure as follows:

Replace the following pages with the attached:

Page 9 of 10
Page 10 of 10

Reason for change: Additional requirement.

Reviewed by:

J. O. Martin 10-1-82
Originator Date

H. B. Root 10-1-82
Brown & Root Quality Assurance Date

Approved by:

Reviewed by: B. C. Scott 10/4/82
TUGCO Quality Assurance Date

O. Frankum 10/1/82
Construction Project Manager Date

10/6/82
Effective Date



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Comanche Peak Steam Electric Station

Sheet 1 of 2

Construction Procedure
DOCUMENT CHANGE NOTICE NUMBER 3

This notice applies to Construction Procedure No. 35-1195-CPM 13.1 Revision 7.

This change will be incorporated in the next revision of the procedure.

Change the procedure as follows:

Replace the following page with the attached:

Page 5 of 10

Reason for change: Change in requirement

J. O. Martin 9-14-82
Originator Date

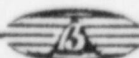
Reviewed by: ^{new} 4-15-82 9/15/82
Brown & Root Quality Assurance Date

Approved by:

Reviewed by: B. G. Scott 9/15/82
TUGCO Quality Assurance Date

D. C. Frankum 9-16-82
Construction Project Manager Date

9/16/82
Effective Date



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INDEXED

JOB 35-1195
Comanche Peak Steam Electric Station DATE

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Construction Procedure
DOCUMENT CHANGE NOTICE NUMBER 2

This notice applies to Construction Procedure No. 35-1195- CPM 13.1 Revision 7

This change will be incorporated in the next revision of the procedure.

Change the procedure as follows:

Replace the following page with the attached:

Page 8 of 10

Reason for change: Additional requirements

Reviewed by:

[Signature] 3/3/82 [Signature] 3/9/82
Originator Date Brown & Root Quality Assurance Date

Reviewed by:

Approved by:

[Signature] 3/17/82
TUGCO Quality Assurance Date

[Signature] 3-17-82 3/18/82
Construction Project Manager Date Effective Date



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Comanche Peak Steam Electric Station

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Construction Procedure
DOCUMENT CHANGE NOTICE NUMBER 1

This notice applies to Construction Procedure No. 35-1195- CPM 13.1 Revision 7.

This change will be incorporated in the next revision of the procedure.

Change the procedure as follows:

Replace the following pages with the attached:

Page 5 of 10

Page 9 of 10

Reason for change: Additional requirements

This change approved by:

Reviewed by:

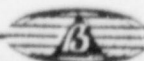
Originator Clark Date 12/30/61

D. L. Sanders 1-13-82
Brown & Root Quality Assurance Date

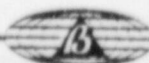
Reviewed by:

D. Frank 1-13-82
Construction Project Manager Date

1/15/82
Effective Date



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4.0	<u>SUPPORTING MATERIALS</u>				
4.1	<u>REFERENCES</u>				
0.ii	<u>LIST OF FIGURES</u>				
13.1-1	CALIBRATION STICKERS				
13.1-2	TOOL DATA ISSUE/RECORD CARD				
13.1-3	CALIBRATION REPORT				
13.1-4	DEFICIENT M&TE EVALUATION REPORT				
13.1-5	RS, CT, M&TE MASTER INDEX				
1.0	<u>INTRODUCTION</u>				
1.1	PURPOSE				
	<p>The purpose of this procedure is to provide instructions to assure that M&TE items, which include tools, instruments, etc., used in activities affecting quality are properly controlled, calibrated and adjusted at specified intervals to maintain accuracy within prescribed limits.</p>				
1.2	SCOPE				
	<p>The scope of this procedure covers the acquisition, control, issue, recall and general calibration instructions for M&TE required in support of B&R activities at this site. The responsibility for implementing the requirements of this procedure for M&TE peculiar to the Field Engineering Department is delegated to the Senior Field Engineer.</p>				
2.0	<u>GENERAL</u>				
	<p>Measuring and test equipment (M&TE) shall be calibrated against measurement standards (reference standards) having known relationships to National Standards where such exist. If reference standards do not exist for a particular item of M&TE, the basis for calibration shall be in accordance with the manufacturer's recommendation and paragraph 3.3.</p>				
	<p>Such devices as rulers, scales and tape measures, which are not likely to drift during use, need not be calibrated against calibration standards.</p>				



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3.0	<u>PROCEDURE</u>				
3.1	CALIBRATION FACILITY				
3.1.1	Environment				
	<p>The Calibration Supervisor will assure that during periods when items are being calibrated, the environment of the Calibration Facility is within the proper limits or that corrections are made for specified variations in temperature and humidity.</p> <p>The environment within the Calibration Facility shall be controlled to $75^{\circ} \pm 10^{\circ}\text{F}$ and 0-60% Relative Humidity.</p>				
3.1.2	Interference				
	<p>Calibration Facility equipment which can be adversely affected by outside vibration, shall be effectively isolated by the use of shock absorbing pads under equipment upon which calibration is performed.</p> <p>Radio Frequency Interference (RFI), electromagnetic interference (EMI) and radiation are not factors adversely affecting the calibration activities in the Calibration Facility which are covered by this procedure.</p>				
3.2	STATUS OF M&TE ITEMS				
3.2.1	Active Status				
	<p>"Active" status of an M&TE item indicates that the item is within prescribed accuracy requirements and suitable for use. The status is documented by a Calibration Report (Figure 13.1-3) in the item's history file and a Calibration Sticker (Figure 13.1-1) attached to the item or its container. The Master Index will also reflect the status as "Active".</p>				
3.2.2	Inactive Status				
	<p>"Inactive" status of an M&TE item indicates that the item is within prescribed accuracy requirements as of last calibration, but is not presently required for use. The status is documented by a Calibration Report in the history file, "Inactive" sticker (Figure 13.1-1) attached to the item, and is stored in a segregated and environmentally controlled area. The Master Index will reflect the status as "Inactive". An item will be recalibrated when removed from "Inactive" status if the calibration interval originally assigned has expired.</p>				



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<p>3.2.3 Out-of-Calibration Status</p> <p>"Out-of-Calibration" (OOC) status of an M&TE item indicates that the item is not within prescribed accuracy requirements, is lost, is stolen, or is damaged. The status is documented by a Calibration Report in the history file for the item and an "OOC" sticker (Figure 13.1-1) is attached to the item, with the exception of lost or stolen items. The Master Index will reflect the status as "OOC". "OOC" items will be stored in a segregated area until repaired or dispositioned.</p> <p>3.2.4 Dropped From System Status</p> <p>"Dropped From System" (DFS) status of an M&TE item indicates that the item is no longer in the calibration program and has been disposed of through proper channels. The status is documented by a Calibration Report in the history file for the item. The Master Index will reflect the status as DFS with a comment indicating disposition and date.</p> <p>3.2.5 New Items</p> <p>Items which are received, but not immediately required, may be stored in a segregated Class A storage area until needed and then processed as new items.</p> <p>3.3 ACQUISITION OF M&TE AND REFERENCE STANDARDS</p> <p>3.3.1 Procurement Responsibility</p> <p>M&TE will be procured through the Calibration Supervisor with ranges, accuracies, precision, durability and special features necessary to support construction and inspection functions on the project.</p> <p>Departments requiring new M&TE may initiate the field requisition for the device. The field requisition shall be marked "M&TE ITEM" and shall include, as a minimum, the following information (when applicable):</p>				



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	<ol style="list-style-type: none"> 1. Manufacturer's name, make, and model number (if known). 2. Accuracy requirements as established by Design Specifications, code requirements, construction procedures or industry practices. 3. Certificates of conformance or certificates of calibration when required. 4. Available literature regarding calibration, adjustments, maintenance, repair and recommended spare parts lists. <p>All purchase requisitions for new M&TE items shall be reviewed by the Calibration Supervisor.</p>			
3.3.2	<p>Reference Standard Accuracy</p> <p>Reference Standards, when not limited by the state-of-the-art, shall have an accuracy four times better than the M&TE to be calibrated. Calibration curves shall be maintained and used for each reference standard when necessary to provide better accuracy.</p>			
3.3.3	<p>Certificates of Certification</p> <p>Certifications shall contain the following information:</p> <ol style="list-style-type: none"> 1. Manufacturer's name, make, model number, and serial number. 2. Identification of calibration standards with serial or calibration report number. 3. Notation of active status of calibration standards used. 4. Calibration date. 5. Signatures and titles of personnel responsible for calibration. 6. B&R purchase order number. 			
3.3.4	<p>Off-Site Calibration Services</p> <p>Off-site calibration services shall be obtained only from suppliers approved by the QA department. If the item is to be serviced but not calibrated, the supplier need not be qualified by QA. The field requisition shall be reviewed by the Calibration Supervisor for calibrated items that require service, repair or recertification by an off-site laboratory or manufacturer. The field requisition shall include the following information:</p> <ol style="list-style-type: none"> 1. Certificates of calibration to include, in addition to paragraph 3.3.3 above, the calibration data in the "As received" condition, as well as data after adjustment (if adjustments are made). 			



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2. Approved calibration procedures if item requires calibration by an off-site laboratory (NBS and state labs approved by NBS are exempt from this requirement).

3.4 CONTROL OF M&TE AND REFERENCE STANDARDS

3.4.1 Inventory Identification Numbers

Each acceptable item of M&TE will be assigned a unique inventory identification number, i.e., M&TE-1234, RS-45, CT-1097. Inventory identification numbers shall not be re-used.

The Inventory Identification shall be scribed, electroetched or stamped directly on the item in a conspicuous place and in a manner which shall not alter the item's characteristics or accuracy. When an item cannot be identified directly, its respective storage container shall be so identified, i.e., gauge block sets and weights.

3.4.2 Master Index

The Calibration Facility shall establish and maintain a Master Index (Figure 13.1-5) which is the record of all assigned items by inventory identification number. The Master Index will include the identification number, description (nomenclature and model number when available), calibration date, calibration due date, calibration interval, current status and accuracy, and may contain additional information as determined necessary by the Calibration Supervisor.

3.4.3 Calibration Stickers

Items received with acceptable certification and items initially calibrated on-site shall have a completed calibration sticker applied to the item and placed under the control of the Calibration Facility, except as noted in paragraph 1.2. The Calibration Sticker will contain the unique M&TE item number, the date of calibration, due date for calibration and initials of a certified calibration person. Certification papers received with a calibrated item will be retained in the item's history file.

3.4.4 Calibration Intervals

Calibration intervals will be established for each item of M&TE (including RS and CT items) by the Calibration Supervisor based on use, environment, durability, type of item, required precision, manufacturer's recommendations or any special requirements dictated by applicable codes or specifications. The Calibration



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Supervisor may alter an established interval, except where prohibited by Code, based on demonstrated stability or other factors affecting measurement control. To increase the calibration interval, the item (or family of items) must have had three successful calibrations during the last three intervals or one year, whichever is less. When calibration intervals are changed, similar items with valid calibration stickers need not be recalled for calibration until their individual calibration intervals expire.

For ASME Code items, the following items of M&TE shall be recalibrated at the specified intervals:

- a. Pressure gauges - before and after each test or series of tests. A series of tests is that group of tests using the same pressure test gauge or gauges which are conducted within a period not to exceed two weeks;
- b. Clamp-on ammeters - when used to check welding equipment;
- c. Voltage and amperage meters on automatic welding equipment shall be calibrated if used for monitoring or recording essential or nonessential variables. Where such meters are not used for these purposes, the meters need not be calibrated;
- d. Charpy impact test machines (once a year, using specimens obtained from the U.S. Army Materials and Mechanics Research Center);
- e. Temperature instruments for impact testing (once every three (3) months).

3.4.5 M&TE Issue

Any M&TE item issued will be logged on a Issue Record Card (Figure 13.1-2) issued with the item. Positive identification of the person signing out the item should be obtained before the item is released.

Daily issues are to be returned to the Calibration Facility by the end of the shift with the Issue Record Card. When the item is returned, the Issue Record Card will be marked with the return date and filed.

Long-term issues to various departments may be kept out of the Calibration Facility until the next calibration due date. The receiving department shall maintain a record of their issue of these M&TE items. The record shall include the following information:



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1. M&TE/Identification Number
2. Date of issue
3. Item on which the M&TE was used.

A "confidence check" to insure accuracy of an M&TE item may be performed at any time. The "confidence check" will include the necessary portions of the applicable Calibration Instruction (IEI) and will be documented. Items which are "confidence checked" immediately prior to issue should have the check noted on the Issue Record Card in the "cal-check" space.

3.4.6 Issue Record Card

The Issue Record Card shall be maintained by the person checking out the item. The individual will record the date of use, the item(s) installed, inspected or tested with the M&TE item during the issue period, and values obtained whether daily or long-term issue.

Completed Tool Data Issue/Record Cards will be maintained until the next calibration due date.

EXCEPTION: Tool Data Issue/Record Cards are not required to be completed for the following:

1. DFT gages not used for final acceptance by the Paint Department;
2. Electrical measuring devices used by Welding Engineering for Welder Parameter monitoring;
3. Electrical measuring devices used by personnel for reasons other than final acceptance, e.g. personnel safety or in-process checks. In such cases, it shall be identified on the record card that the item was not used for final acceptance;
4. When an item is checked out and not used, the only entry required shall record that the M&TE was not used.

CALIBRATION MANUAL

The calibration Supervisor will approve detailed calibration instructions (IEI) for each item or family of items to be calibrated by B&R. A copy of each approved IEI will be maintained in Calibration Facility along with a copy of this procedure.

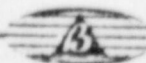
The "IEI-Series Calibration Manual" is a compilation of individual calibration instructions. When individual IEI's are revised or added to the series, the Title Page and Contents sheet for the entire manual is revised to reflect the latest contents and a review/approval signature sheet will be made each time the series is revised.



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Each IEI shall contain the following basic information where applicable:

1. Identify of the item.
2. Calibration equipment and reference standards to be used.
3. Checks, tests, measurements and acceptance criteria.
4. Sequence of operations.
5. Special instructions where necessary.
6. Connection diagrams where appropriate.



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3.6 RECALL AND CALIBRATION

The Calibration Supervisor shall be responsible for the maintenance of a Calibration Recall Schedule through the Master Index program and the timely recall of items for calibration. Items will normally be recalibrated on or before the calibration due date.

If the calibration due date of an item expires before it is returned to the Calibration Facility, a Deficient M&TE Evaluation Report will be issued to the user of the item and a copy submitted to the Site QA Manager.

The person performing the calibration shall complete a Calibration Report (Figure 13.1-3). He shall record the appropriate data and remarks, sign and date the report. The Calibration Supervisor or Engineer will review the report for the reference standard used in calibration.

If the calibration results are satisfactory, in accordance with the IEI, a new calibration sticker will be placed on the item and the item will be returned to the active status. The Master Index will then be updated to show the new calibration date and due date.

3.7 DEFICIENT, DAMAGED OR LOST M&TE

3.7.1 Deficient M&TE Evaluation Reports

If an M&TE item is found out-of-calibration (OOC) or is lost/stolen, a Deficient M&TE Evaluation Report (Figure 13.1-4) for the item shall be prepared. For lost or stolen M&TE, a note will be added on the M&TE index indicating it is lost or stolen.

All Issue Record Cards and Tool Data Record Cards for the M&TE item since the last successful calibration or confidence check and the Calibration Report will be attached to the Deficient M&TE Evaluation Report. One copy of the report will be filed in the item's history file and one copy will be forwarded to QE for evaluation. If the evaluation by QE indicates that previous activities on which M&TE were used is unacceptable, QE shall prepare an NCR in accordance with QA procedures and the Deficient M&TE Evaluation Report will be closed and will reference the NCR number.

Completed Deficient M&TE Evaluation Reports will be returned to the Calibration Facility and filed in the item's history file.

3.8 EXTENSIONS OF CALIBRATION INTERVALS

When requested in writing, the Senior Staff Engineer may permit the use of reference standards of M&TE items beyond their cali-



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bration due date provided there is sufficient justification. The request shall identify the item(s), intended use and length of extension requested. The item shall be calibrated immediately at the end of the extended period to verify accuracy. While in effect a copy of the approved extension request shall be filed in the item(s) history file and the Master Index updated to show the extended calibration due date with a comment referring to the extension. The request for calibration extensions shall have the concurrence of QA.

3.9 TRAINING AND CERTIFICATION

All Brown & Root employees having a functional responsibility covered by this procedure shall attend the QA Department Indoctrination course as described in the QA Personnel Training Manual, and additional training as outlined in CP-CPM 2.1.

3.10 LIMITATION ON USE

Calibrated items may be calibrated over part of their range. These items may be issued for use provided they are labeled in a distinctive manner, indicating the usable range. The Calibration Report shall show that the item is to be used on a limited basis.

3.11 SPECIAL STATUS OF PRESSURE GAUGES

Pressure gauges used for "Q" hydrostatic-test purposes are listed on the Master Index under "Special" status. This indicates that the gauge will be calibrated prior to issue and a calibration sticker affixed. When the gauge is returned, it will be calibrated again and the sticker removed while it is in the Calibration Facility. Maximum calibration interval for these gauges when calibrated and issued is two weeks. These gauges are to be stored in the Calibration Facility in a segregated storage area.

4.0 SUPPORTING MATERIALS

4.1 REFERENCES

4.1.1 Brown & Root Quality Assurance Manual, Section 13.

4.1.2 Brown & Root CPSES Construction Procedure, CP-CPM 2.1, "Calibration Personnel Requirements and Training"



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FIGURE CPM-13.1-1
CALIBRATION STICKERS

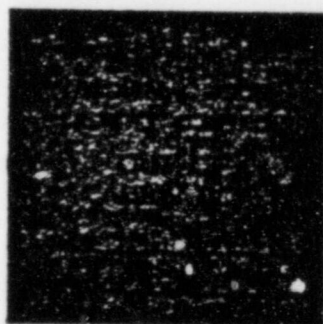
BROWN & ROOT, Q/C
CALIBRATED

NO. _____

DATE _____

DUE _____

INSPECT _____



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FIGURE CPM 13.1-4
DEFICIENT M&TE EVALUATION REPORT
(Per CP-CPM-13.1)

REPLY DUE: _____

CONTROL NO: _____

CPSES 35-1195

ISSUE DATE: _____

NOTE: This report with reply should be returned to the Calibration Facility within five (5) working days from date of issue as shown above.

TO: _____ COPY TO: _____

ITEM DESCRIPTION: _____ IDENT. NO: _____

DATE LAST RECORDED CHECK: _____

DEFICIENCY: _____

SEE ATTACHED:

Calibration Report ☐
Issue Record Cards ☐
3-Part Memo ☐
Other _____ ☐

SIGNATURE: _____

DATE: _____

REPLY

Per CP-CPM-13.1 a record of all items installed, inspected or tested with this M&TE item since the last recorded check must be attached or included as a part of your reply to this deficiency.

COMMENTS: _____

DATE: _____

SIGNATURE: _____

QUALITY ENGINEERING REVIEW

QUALITY ENGINEER: _____ DATE: _____

CLOSED ☐ NCR ISSUED ☐ NCR # _____ DATE: _____

COMMENTS: _____



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FIGURE CPM 13.1-5
RS, CT, M&TE MASTER INDEX

BROWN & ROOT INC.													
RS, CT, M&TE MASTER INDEX													
EQUIPMENT CALIBRATION MASTER													
PROGRAM CC401													
01 OPT(1)													
NOVEMBER	COMMENT	MODEL	CALIB INTVL	WHERE CALIB	STATUS	DATE CAL	DATE DUE	PU/FR	CAT	LOCATION	IDENT	REMARKS	
NOV		REF STD NOV		REFERENCE STANDARD									
TORQUE WRENCH 10-150 FTLB 0010-4			90	CP	DOC	18JUL79	00013	1		CT-0000			
LOST 10AUG79			010	AS	RS=10		IEI=13						
TORQUE WRENCH 10-150 FTLB 0010-4			90	CP	DOC	20DEC79	00013	1		CT-0001			
LOST 10JAN80			010	AS	RS=10		IEI=13						
TORQUE WRENCH 10-150 FTLB 0010-4			90	CP	DOC	25OCT78	00013	1		CT-0002			
LOST 27JAN79			010	AS	RS=10		IEI=13						
TORQUE WRENCH 10-150 FTLB 0020-1			90	CP	ACTIVE	00OCT81	00013	1	CP	CT-0003			
LOST 15AUG78			010	AS	RS=10		IEI=13						
TORQUE WRENCH 10-150 FTLB 0020-1			90	CP	DOC	17MAY78	00013	1		CT-0004			
LOST 15AUG78			010	AS	RS=10		IEI=13						
TORQUE WRENCH 10-150 FTLB 0020-1			90	CP	DOC	17MAY78	00013	1		CT-0005			
LOST 17MAY78			010	AS	RS=10		IEI=13						
TORQUE WRENCH 10-150 FTLB 0020-1			90	CP	DPB	21JUN77	00013	1		CT-0006			
LOST 21JUN77			010	AS	RS=10		IEI=13						
TORQUE WRENCH 10-150 FTLB 0020-1			90	CP	DPB	30JAN78	00013	1		CT-0007			
LOST 30JAN78			010	AS	RS=10		IEI=13						
TORQUE WRENCH 10-150 FTLB 0020-1			90	CP	ACTIVE	03SEP81	00013	1	CP	CT-0008			
LOST 03SEP81			010	AS	RS=10		IEI=13						
TORQUE WRENCH 10-150 FTLB 0020-1			90	CP	DOC	18MAY79	00013	1		CT-0009			
LOST 20JUN79			010	AS	RS=10		IEI=13						

—SAMPLE—



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