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## COMPANY PROCEDURE

FOR

RWS POST REPAIR ESS

**811786**

### APPROVAL MATRIX

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Approved by QE Manager Date	Gerry Bellehumeur Director Quality Oct 2, 2002	Gerry Bellehumeur Director Quality Nov 2004	Gerry Bellehumeur Director Quality Jan 2005	Gerry Bellehumeur Director Quality May 2005	
Signature QE Director Date					

**REVISION RECORD**

<b>REVISION</b>	<b>BY</b>	<b>CHANGES</b>	<b>DATE</b>
1	Ron Domitrovits	First Release	October 2002
2	John Wood	Revised	November 2004
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**1. INTRODUCTION**

**1.1. Purpose**

The purpose of this document is to define the ESS requirements for RWS post repair based on the type of repair and nature of field failure. This procedure will provide the process flow for RWS post repair ESS.

**1.2. Scope**

The scope of this document covers all warranty and non-warranty products that are returned for repair, retrofit and / or upgrade that are not bound by a contractual requirement for post repair ESS. This process shall be used as a guideline and shall be referenced and followed by all CWCEC RWS staff.

**1.3. Related Documents**

800377 Repair & Warranty Services Procedure

**1.4. Definitions**

RWS	Repair and Warranty Service
DST	Dynamic Stress Test
ESS	Environmental Stress Screening
EDST	Enhanced Dynamic Stress Test
VST	VxWorks Stress Test
ATP	Acceptance Test Procedure
CPU	Central Processing Unit
BGA	Ball Grid Array
CGA	Column Grid Array
STEP	System Technology Enhancement Program
Contract	mutual agreement of terms & conditions

**1.5. Procedure Owner/Business Process Owner**

The Manager of Repair and Warranty Services owns this procedure, which along with the Manager of Mechanical Engineering, the ESS design authority, shall approve any and all changes regarding this procedure.

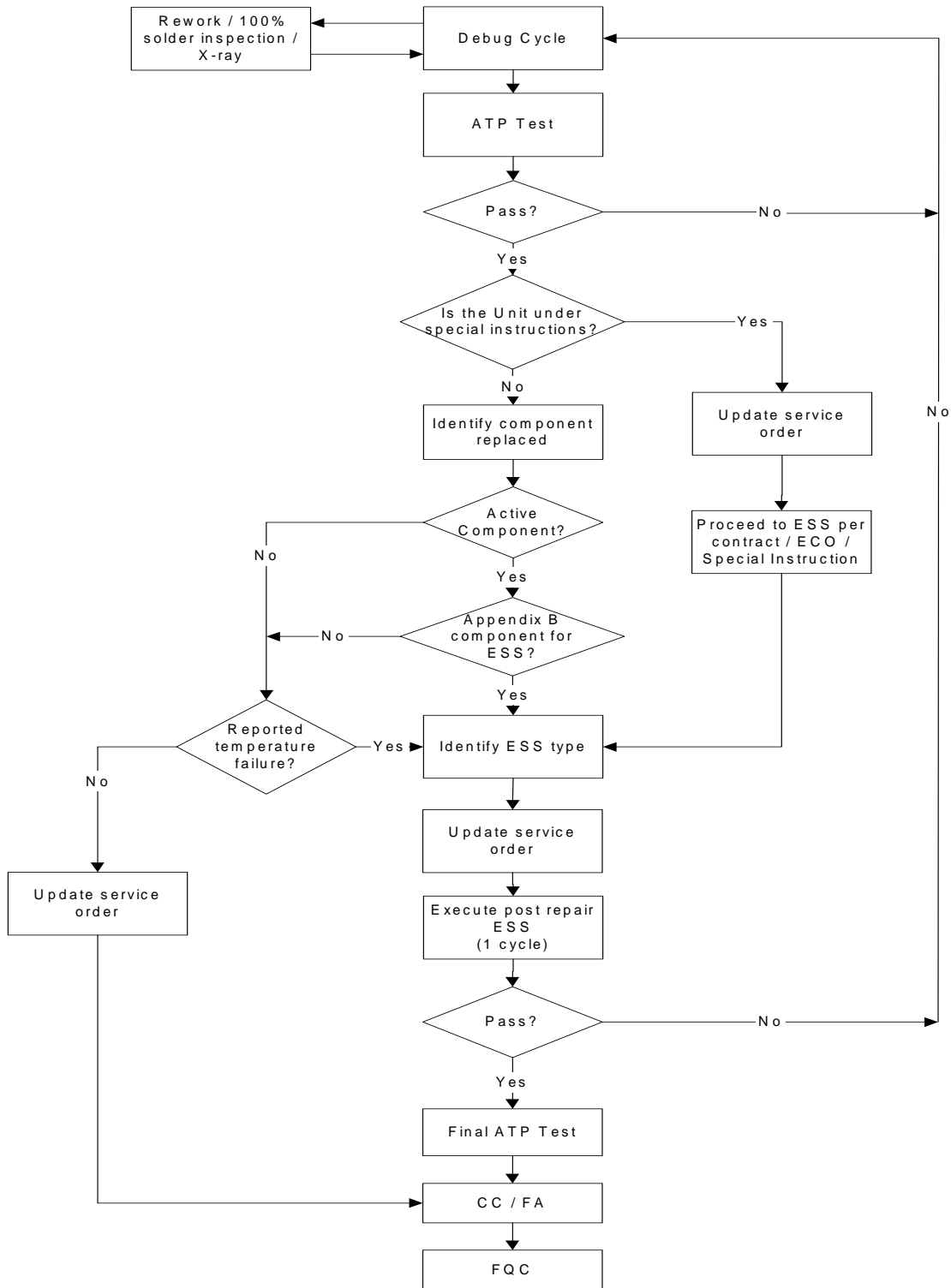
**2. RESPONSIBILITIES**

- 2.1 Manager Repair and Warranty Services - The individual is responsible for training of RWS staff of new ESS procedure.
- 2.2 Director of Quality Assurance - The Director of Quality Assurance shall approve any and all changes to this process or associated procedure.
- 2.3 Mechanical Engineering Manager – Is the technical authority that defines the ESS requirements based on the type of repair and nature of failure of the CWCEC returned product.
- 2.4 RWS Debug Technician – Identifies and executes the appropriate level of ESS testing based on the requirements set forth in this procedure. The RWS Technician is responsible for following the prescribed ESS procedure that is documented in the product ATP (only the number of ESS cycles may be deviated from the prescribed ESS procedure to what is documented in this procedure). The RWS Technician is responsible to update the RWS traveler identifying the level of testing performed post repair.
- 2.5 RWS Rework Operator - The individual is responsible for performing 100% solder inspection (where applicable) of reworked components of repaired product, either by a scoped inspection or x-ray analysis.

**3. ACTION / METHOD**

- 3.1 All RWS activities performed during the repair cycle are in accordance with the comp procedure 800377 Repair & Warranty Services.
- 3.2 This section outlines the method of identifying when DST, EDST and VST are required based on the type of repair performed to a faulty circuit card assembly that has been returned.
- 3.3 Having completed the debug cycle and subsequent product testing / validation, the RWS Debug Technician identifies the type of component that was replaced as part of the repair and/or retrofit.
- 3.4 Based on the repair, the RWS Debug Technician identifies ESS type as defined by the RWS Post Repair ESS guidelines attached in Appendix A.
- 3.5 The RWS Debug Technician shall update the applicable Service Order indicating the level of ESS testing, if required. Technician shall select the following:
  - ESS Type i.e. VST, EDST, DST
  - Specify procedure number and revision
  - Specify test duration i.e. standard (per procedure), 1 cycle
  - In lieu of ESS testing, 100% solder joint inspection shall be performed, per Appendix B
- 3.6 Execute recommended testing. All ESS test equipment, acceptance criteria, and procedure are defined in the applicable ESS procedure identified in the product ATP. Technician records the following:
  - Test execution date
  - Record pass / fail
  - Provide failure information if any i.e. fails @ hot soak 71degC
- 3.7 Final product testing / validation per applicable CWCEC procedure.
- 3.8 A Quality Assurance representative shall inspect all repaired product in accordance with company procedure 800377 Repair & Warranty Services, this procedure, CWCEC workmanship standards, and the prescribed ESS procedure.

4. PROCESS FLOWCHART



5. RECORDS

The RWS debug technician shall update the applicable SAP service order as follows:

- Identify using the RWS Test technician stamp number
- Select the appropriate level of ESS i.e. VST, EDST, DST, Custom
- Specify the duration of the ESS run, expressed in number of cycles.

**POST REPAIR ESS**

CYCLE #1

Technician : <John Smith>

-----  
ESS Required: VST X EDST \_\_\_ DST \_\_\_ Custom \_\_\_

Procedure #: <810000> Revision: <A>

Duration: <standard>

-----  
ESS Run Date: \_\_\_\_\_

Pass: \_\_\_\_\_

Fail comments: (record temperature) Temperature: \_\_\_\_\_

-----  
CYCLE #2 (if required)

Technician : <John Smith>

-----  
ESS Required: VST \_\_\_ EDST <X> DST \_\_\_ Custom \_\_\_

Procedure #: <810010> Revision: <B>

Duration: <1 cycle>

-----  
ESS Run Date: \_\_\_\_\_

Pass: \_\_\_\_\_

Fail comments: (record temperature) Temperature: \_\_\_\_\_

**APPENDIX A      RWS POST REPAIR ESS GUIDELINES**

**A.1            Passive Component Repair**

All Standard Product and Customer Specific passive component repairs resulting from temperature related field failures require an ESS cycle. The Debug Technician shall specify the type of approved ESS required based on the functional circuit affected by the repair.

Unless otherwise specified by customer specific contract, ECO or special instruction, all passive component repairs not related to temperature field failures are exempt from post repair ESS. 100% solder inspection is required, completed by the Rework Operator, of any reworked area.

All Customer Specific passive component repairs governed by a Customer Specific contract shall follow the guidelines for post repair ESS as outlined therein.

**A.2            Active Component Repair**

All Standard Product and Customer Specific active component repairs resulting from temperature related field failures require an ESS cycle. The Debug Technician shall specify the type of approved ESS required based on the functional circuit affected by the repair.

Unless otherwise specified by customer contract, ECO or special instruction, all Standard Product non-BGA / CGA active component repairs not relating to temperature failures are exempt from performing post repair ESS cycle. The Rework Operator shall perform a 100% solder inspection of any reworked area is required, either by a scoped inspection or x-ray analysis.

All Customer Specific active component repairs governed by a Customer contract shall follow the guidelines for post repair ESS as outlined therein.

All Customer Specific and STEP products that are governed by standard product ESS procedures shall follow the same guidelines for standard product post repair ESS.

All other active component repairs may require a post repair ESS cycle as defined in Appendix B.

**APPENDIX B RWS POST REPAIR ESS TABLE**

Component repairs shall require testing as specified in the following table:

<b>Product</b>	<b>Failure/Repair Type</b>	<b>ESS Type</b>	<b>Duration</b>	<b>Comment</b>
176/177 and older	Thermal Fail, core oscillator	DST	1 cycle	Per applicable procedure
176/177 and older	All active (non thermal failures, core oscillator (above))	N/A	N/A	100% solder inspection
176/177 and older	Non-warranty, except thermal failure, oscillator (above)	N/A	N/A	100% solder inspection
178/179	Thermal Fail (warranty / non-warranty)	VST/EDST	Std / 1 cycle	ESS type depends on functional circuit affected.
178/179	Core BGA / CGA (CPU, memory, L2 Cache, Bridge control, core oscillator) – warranty only	VST	Standard	Per applicable procedure
178/179	Peripheral BGA (e.g. Universe & 32Mhz Oscillator) – warranty only	EDST	1 cycle	Per applicable procedure
178/179	All active, non core, non thermal failures	N/A	N/A	100% solder inspection
178/179	Non-warranty, except thermal failures (above)	N/A	N/A	100% solder inspection
181 and newer	Thermal failure (warranty / non-warranty)	EDST	1 cycle	Per applicable procedure
181 and newer	Core BGA / CGA (CPU, memory, L2 Cache, Bridge control, core oscillator) – warranty only	EDST	1 cycle	Per applicable procedure
181 and newer	Peripheral BGA (e.g. Universe & 32Mhz Oscillator) – warranty only	EDST	1 cycle	Per applicable procedure
181 and newer	All active, non core, non thermal failures	N/A	N/A	100% solder inspection
181 and newer	Non-warranty, except thermal failures (above)	N/A	N/A	100% solder inspection
All other Standard Product	Core BGA / CGA, repairs due to thermal failure	DST/EDST	1 cycle	Per applicable procedure
All Customer specific product that follow Std. ESS procedure and not listed above	Core BGA / CGA, repairs due to thermal failure	DST/EDST VST	1 cycle Standard	Per applicable procedure
All Step product that follow Std. ESS procedure	Core BGA / CGA, repairs due to thermal failure	DST/EDST	1 cycle	Per applicable procedure