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|  | Centerwide System Level Procedure ISO 9001 - Ames Research Center | Document #: | Rev.: |
| | | 53.ARC.0014 | 7 |
| Title: | | Page #: | |
| Corrective and Preventive Action | | 1 of 9 | |

| REVISION HISTORY | | | |
|------------------|---|-------------|----------------|
| Rev | Description of Change | Author | Effective Date |
| 0 | Initial Release | K. Zander | 5/27/98 |
| 1 | Match Procedure to Process | R. Navarro | 7/17/98 |
| 2 | Clarifications based on 7/98 DNV Audit and 6/98 Internal Audit (see DCR 98-013). Major rewrite. | M. Hines | 9/25/98 |
| 3 | Clarifications based on 11/98 DNV Audit. Major rewrite. (DCR 98-067) | R. Serrano | 12/18/98 |
| 4 | Changed 6.2.2 from "complete fields 1, 2, and 12B" to "complete fields 1 and 2," 6.2.3.2.1 from "Complete fields 13 and 14" to "Complete fields 12B, 13, and 14." | R. Serrano | 2/9/99 |
| 5 | Section 5.4 add "file copies of objective evidence which support verification and validation of CAR closure." (DCR 99-013) | R. Serrano | 6/2/99 |
| 6 | Clarifications in section 7 on SLP Metrics (DCR 99-035) | R. Williams | 10/6/99 |
| 7 | Clarify Centerwide Corrective Request Coordinator's responsibilities in section 5.4, 6.2.2, 6.2.7, 6.2.11 and 6.5. Reference CAR ARC-00920. (DCR 01-007) | J. Weller | 9/6/01 |

| REFERENCE DOCUMENTS | |
|---------------------|---|
| Document Number | Document Title |
| 53.ARC.0000 | Ames Research Center Quality Manual, Section 4.14 |
| 53.ARC.0013 | Control of Nonconforming Products and Services |
| 53.ARC.0016 | Quality Records |
| 53.ARC.0017 | Internal Quality Audit |

Documents referenced in this procedure are applicable to the extent specified herein.

1. Purpose

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|---|---|-----------------------------------|--------------------------|
|  | Centerwide System Level Procedure ISO 9001 - Ames Research Center | Document #: 53.ARC.0014 | Rev.: 7 |
| | Title: Corrective and Preventive Action | | Page #: 2 of 9 |

This procedure establishes the process to correct the cause(s) of nonconformances or potential nonconformances in products, processes, the Quality System, and/or services at Ames Research Center (ARC) in accordance with the ARC Quality Manual.

2. Scope

This procedure is applicable to all organizations providing products and services governed by the requirements specified within the ARC Quality System.

3. Definitions and Acronyms

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| 3.1. | CAR Originator | Any person at ARC who identifies a nonconformance, defect, or undesirable situation and initiates a CAR |
| 3.2. | Centerwide Corrective Action Request Coordinator (CWCARC) | Centerwide person responsible for processing CARs and administering the corrective and preventive action system |
| 3.3. | Corrective Action | Action taken to eliminate the cause(s) of an existing nonconformance, defect, or other undesirable situation in order to prevent recurrence |
| 3.4. | Corrective Action Request (CAR) | Request to initiate corrective or preventive action |
| 3.5. | Nonconformance | Nonfulfillment of a specified requirement |
| 3.6. | Preventive Action | Action taken to eliminate the cause(s) of a potential nonconformance, defect, or other undesirable situation in order to prevent occurrence |
| 3.7. | Responsible Directorate | Directorate to which the Responsible Manager reports for the action required by the CAR |
| 3.8. | Responsible Manager | Person having the responsibility and authority to accomplish/implement a specific activity or process (includes organizational line managers, project managers, etc.) |
| 3.9. | Root Cause | Fundamental deficiency that results in a nonconformance and must be corrected to prevent recurrence of the same or similar nonconformance |

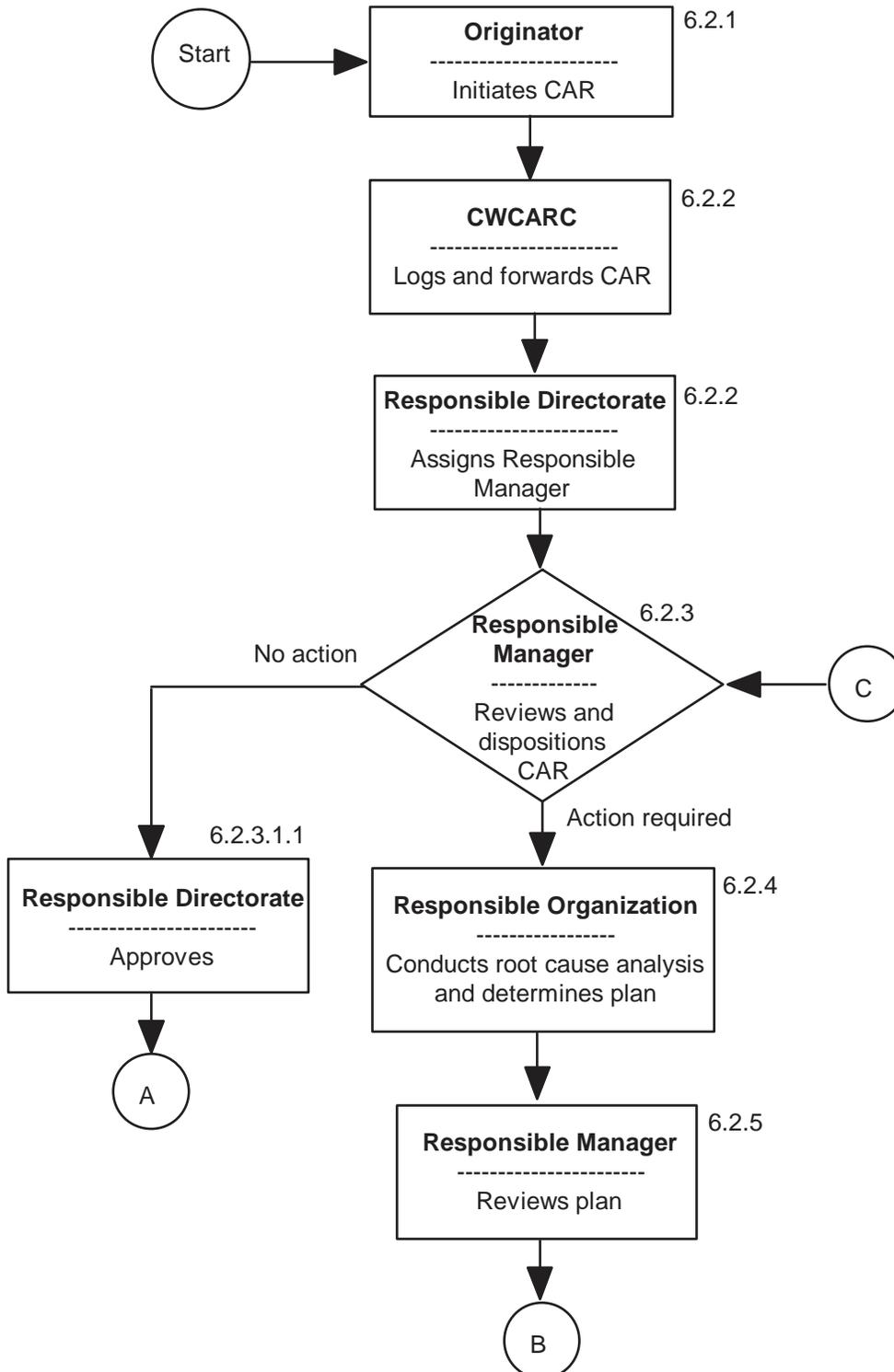
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|---|--|---|---------------------------|
|  | <p align="center">Centerwide System Level Procedure ISO 9001 - Ames Research Center</p> | <p>Document #: 53.ARC.0014</p> | <p>Rev.: 7</p> |
| <p>Title: Corrective and Preventive Action</p> | | <p>Page #: 3 of 9</p> | |

3.10. Signature/Sign

Handwritten, electronically-written, or electronically-typed name of an individual that indicates an act of approval, disapproval, review, etc.



4. Flowchart





Centerwide System Level Procedure

ISO 9001 - Ames Research Center

Document #:

53.ARC.0014

Rev.:

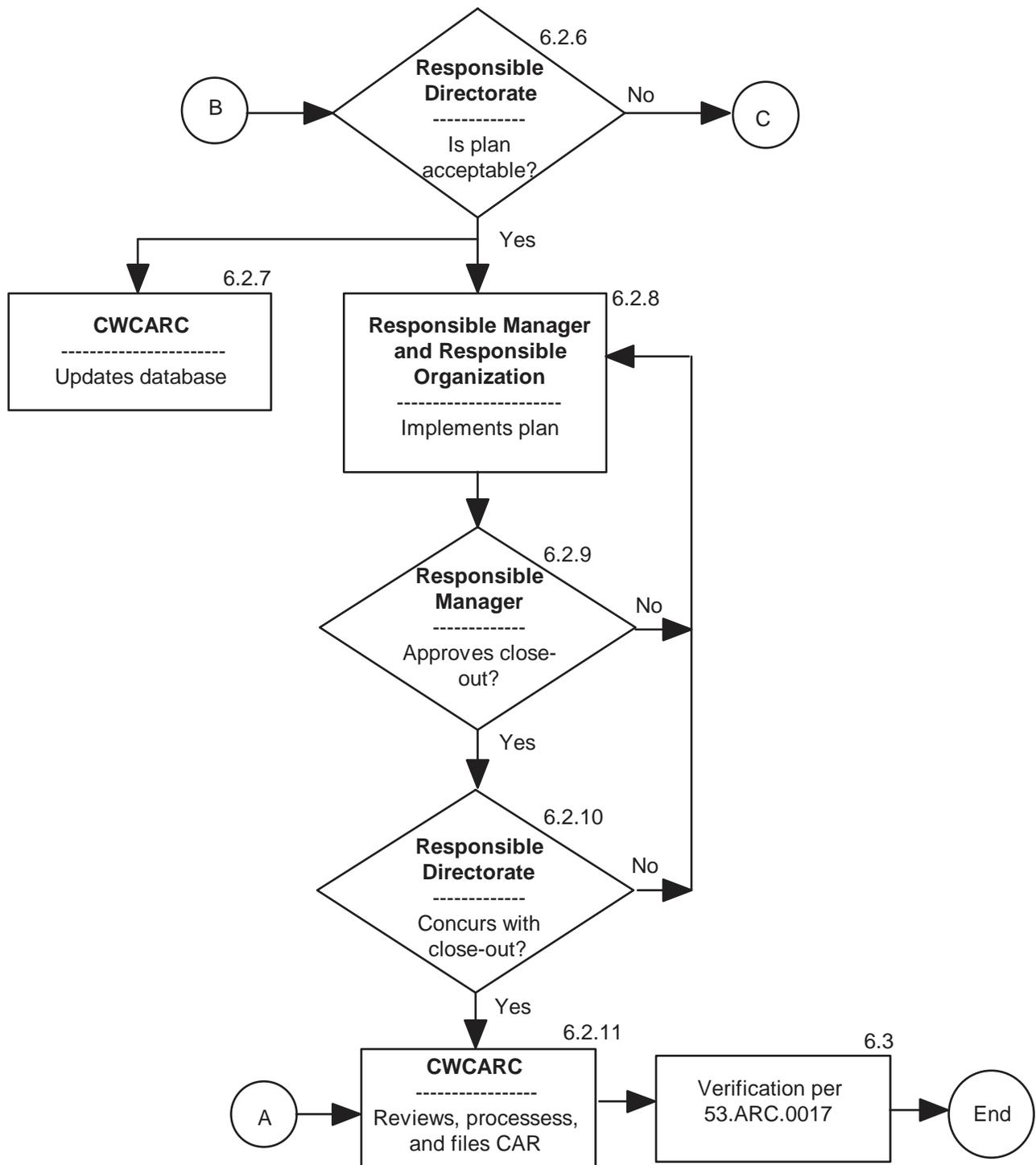
7

Title:

Corrective and Preventive Action

Page #:

5 of 9



| | | | |
|---|---|---|---------------------------|
|  | <p style="text-align: center;">Centerwide System Level Procedure ISO 9001 - Ames Research Center</p> | <p>Document #: 53.ARC.0014</p> | <p>Rev.: 7</p> |
| <p>Title: Corrective and Preventive Action</p> | | <p>Page #: 6 of 9</p> | |

5. Responsibilities

- 5.1. **Responsible Directorate** shall:
- review and assign CAR to Responsible Manager,
 - approve proposed corrective or preventive action, and
 - approve close-out of corrective or preventive action.
- 5.2. **Responsible Manager** shall:
- review CAR and determine if corrective or preventive action is warranted,
 - assign CAR to the responsible organization for action needed,
 - review corrective or preventive action to verify implementation, and
 - review and evaluate customer comments and generate CARs if appropriate.
- 5.3. **Responsible Organization** shall:
- investigate and determine root cause(s) of nonconformance, and
 - identify and implement timely corrective or preventive action.
- 5.4. **CWCARC** shall:
- assign CAR number and update master ARC CAR log,
 - **review CARs for clarity and completeness,**
 - monitor CAR status to ensure complete and timely response,
 - file completed CARs and update log,
 - track CAR completion dates,
 - provide copy of completed CAR to the CAR Originator,
 - develop, maintain, and report metrics as defined in the Metrics section of this document,
 - provide corrective or preventive action metrics to the Quality System Management Representative,
 - train and support users of the CAR system, if needed, and
 - coordinate with other Corrective Action Request Coordinators as required during processing.
 - file copies of objective evidence which support verification and validation of CAR closure.
- 5.5. **CAR Originator** shall:
- initiate CAR when a need for corrective or preventive action is identified.

6. Procedure

- 6.1. The CAR process shall be initiated whenever a condition warrants an investigation to determine if corrective or preventive action is required.
- 6.1.1. Corrective action shall be documented using the CAR form (ARC 755) and processed electronically or via hard copy in accordance with this

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|---|---|---|---------------------------|
|  | <p style="text-align: center;">Centerwide System Level Procedure ISO 9001 - Ames Research Center</p> | <p>Document #: 53.ARC.0014</p> | <p>Rev.: 7</p> |
| <p>Title: Corrective and Preventive Action</p> | | <p>Page #: 7 of 9</p> | |

document. Corrective action shall be initiated as a result of, but not limited to, the following:

- Nonconformances identified during audits and audits of suppliers' Quality Systems
- Action items from executive management reviews of Quality System effectiveness
- Customer complaints
- Process or product problems identified by employees
- Review of trends or significant discrepancies discovered by analysis of Nonconformance Reports (see 53.ARC.0013)

6.1.2. Preventive action shall be documented using the CAR form (ARC 755) and processed electronically or via hard copy in accordance with this document. Preventive action shall be determined from the analysis of appropriate data to detect trends and identify causes that may result in future nonconformances. Data sources may include, but are not limited to, the following:

- Equipment operation logs and process charts
- Supplier performance records
- Internal and external audit reports
- Corrective or preventive action data
- Concessions (waivers/deviations), service reports, and customer comments

6.2. Process

A CAR can be processed using either an electronic or a hard copy version of the CAR form (ARC 755). All fields must be filled out for the form to be complete. The CWCARC shall keep a hard copy of each completed form as a Quality Record.

6.2.1. The CAR Originator shall:

6.2.1.1. Identify a need for corrective or preventive action.

6.2.1.2. Obtain a CAR form (ARC 755) from <http://dqa.arc.nasa.gov/iso9000> and complete fields 3–7, 11, and 12A. Give sufficient detail in field 11 to completely describe the problem. Site objective evidence when possible. If the CAR is a result of an audit, the auditor or designee shall also complete fields 8–10.

6.2.1.3. Forward the CAR form to the CWCARC.

6.2.2. The CWCARC shall verify that required fields are **appropriately and unambiguously completed**, complete fields 1 and 2, and log the CAR. If the CAR is not complete, the CWCARC shall return the CAR to the

| | | | |
|---|--|---|---------------------------|
|  | <p align="center">Centerwide System Level Procedure ISO 9001 - Ames Research Center</p> | <p>Document #: 53.ARC.0014</p> | <p>Rev.: 7</p> |
| <p>Title: Corrective and Preventive Action</p> | | <p>Page #: 8 of 9</p> | |

Originator for completion. The completed CAR form shall be forwarded to the Responsible Directorate who will then forward it to the appropriate Responsible Manager.

- 6.2.3. The Responsible Manager shall review the CAR to determine if corrective or preventive action is warranted.
 - 6.2.3.1. If corrective or preventive action is not warranted, the Responsible Manager shall complete fields 13–16, 17A, 18, 19A, and 20A of the CAR form, identifying in field 16 the reason why action is not warranted, and return the CAR form to the Responsible Directorate within 10 working days of the CAR being posted on the web site.
 - 6.2.3.1.1. The Responsible Directorate reviews the response, signs fields 19B and 20B, and forwards the form to the CWCARC within 5 working days. Go to step 6.2.11.
 - 6.2.3.2. If corrective or preventive action is warranted, the Responsible Manager shall:
 - 6.2.3.2.1. Complete fields 12B, 13, and 14 of the CAR form. Identify if immediate action is required and implement such action to prevent additional loss or damage or to mitigate resulting deficiencies.
 - 6.2.3.2.2. Forward the CAR to the responsible organization for further action.
- 6.2.4. The responsible organization shall:
 - 6.2.4.1. Investigate and determine the root cause(s) of the nonconformance and document the root cause(s) in field 16 of the CAR form.
 - 6.2.4.2. Determine a plan to eliminate the root cause(s) of the nonconformance, taking into consideration the magnitude of the problem and the risk involved, and document the plan in fields 15 and 17A of the CAR form.
- 6.2.5. The Responsible Manager reviews the plan for feasibility and completeness. When satisfied with the plan, the Responsible Manager forwards a copy of the CAR form to the Responsible Directorate within 10 working days of the CAR being posted on the web site.
- 6.2.6. The Responsible Directorate reviews the proposed corrective or preventive action. When the plan is satisfactory, the Responsible Directorate completes field 17B, notifies the Responsible Manager,

| | | | |
|---|--|---|---------------------------|
|  | <p align="center">Centerwide System Level Procedure ISO 9001 - Ames Research Center</p> | <p>Document #: 53.ARC.0014</p> | <p>Rev.: 7</p> |
| <p>Title: Corrective and Preventive Action</p> | | <p>Page #: 9 of 9</p> | |

and forwards the copy of the form to the CWCARC within 5 working days.

- 6.2.7. The CWCARC **reviews the CAR for clarity and completeness and** updates the database with the proposed corrective or preventive action.
- 6.2.8. The responsible organization shall:
 - 6.2.8.1. Execute the plan to eliminate the root cause(s) of the nonconformance, using appropriate change control procedures for all changes to processes, procedures, designs, drawings, and other documentation.
 - 6.2.8.2. Complete field 18 of the CAR form, noting all objective evidence of the completion of corrective or preventive action and return the CAR form to the Responsible Manager.
- 6.2.9. The Responsible Manager shall review the corrective or preventive action to verify its implementation.
 - 6.2.9.1. If the corrective or preventive action taken is not complete or acceptable, the Responsible Manager shall identify in field 18 of the CAR form the reason it was not complete or acceptable and return the CAR form to the responsible organization for further action.
 - 6.2.9.2. If the corrective or preventive action taken is complete and acceptable, the Responsible Manager shall sign and date fields 19A and 20A of the CAR form, indicating closure of the CAR, and forward the CAR form to the Responsible Directorate.
- 6.2.10. The Responsible Directorate shall review the corrective or preventive action.
 - 6.2.10.1. If the corrective or preventive action taken is not complete or acceptable, the Responsible Directorate shall return the CAR form to the Responsible Manager for re-work.
 - 6.2.10.2. If the corrective or preventive action taken is complete and acceptable, the Responsible Directorate will sign and date fields 19B and 20B of the CAR form, indicating concurrence with closure of the CAR, and forward the CAR form to the CWCARC within 5 working days.

| | | | |
|---|---|--------------------|----------|
|  | Centerwide System Level Procedure ISO 9001 - Ames Research Center | Document #: | Rev.: |
| | | 53.ARC.0014 | 7 |
| Title: | | Page #: | |
| Corrective and Preventive Action | | 10 of 9 | |

6.2.11. The CWCARC shall review the CAR form for **clarity and completeness**, process and file the form, and forward a copy of the completed form to the CAR Originator. If the CAR form is not complete, the CWCARC will return the form to the Responsible Directorate for completion before the CAR form is processed and filed.

6.3. Verification
Internal auditors shall verify effectiveness of action taken in accordance with 53.ARC.0017.

6.4. Organizational Interfaces
Organizations and Projects may assign a Corrective Action Request Coordinator to interface with the CWCARC and enhance the CWCARC's ability to process CARs and administer the corrective and preventive action system.

6.5. **The CWCARC shall analyze corrective and preventive action data in accordance with Section 7 – Metrics.**

7. Metrics

Patterns and trends in corrective and preventive action data shall be analyzed, reported and reviewed by appropriate levels of management in order to:

- Monitor the timeliness and adequacy of corrective and preventive actions.
- Identify additional opportunities for improvement of processes, products and the quality management system.

8. Quality Records

The following Quality Records shall be generated and managed in accordance with 53.ARC.0016.

| Required Record | Custodian |
|------------------------------|-----------|
| Completed CAR form (ARC 755) | CWCARC |

9. Form(s)

Forms required for this document:

| Form Number | Title |
|-------------|---------------------------|
| ARC 755 | Corrective Action Request |