**Module Design Document**

**For**

**VrfyCritReg**

**May 24, 2017**

**Prepared For:**

**Software Engineering**

**Nexteer Automotive,**

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**Nexteer Automotive,**

**Saginaw, MI, USAChange History**

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | **Author** | **Version** | **Date** |
| Initial Version | Sankardu Varadapureddi | 1 | 14-Jan-2016 |
| Updated to “ Critical register” checks at init and periodic functions | Selva Sengottaiyan | 2 | 14-Apr-2016 |
| Updated to include support for MCAL write verify failures | Avinash James | 3 | 24-May-2017 |

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# Introduction

## Purpose

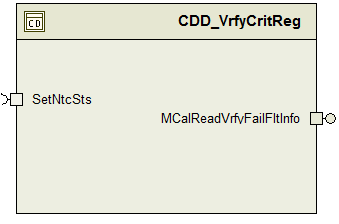
## Scope

# VrfyCritReg High-Level Description

Refer to FDD

# Design details of software module

## Graphical representation of VrfyCritReg

**

## Data Flow Diagram

Refer FDD

### Component level DFD

### Function level DFD

# Constant Data Dictionary

## Program (fixed) Constants

### Embedded Constants

Refer .m file

#### Local Constants

|  |  |  |
| --- | --- | --- |
| Constant Name | Data Type | Value |
| SYSCRITREGFLT\_CNT\_U08 | uint8 | 2 |
| CRITREGFLT\_CNT\_U08 | uint8 | 1 |
| NOFLT\_CNT\_U08 | uint8 | 0 |
| SHIFTBYBYTE\_CNT\_U08 | uint8 | 8 |
| VRFYCRITREGMCALFLT\_CNT\_U08 | uint8 | 4 |

# Software Component Implementation

## Sub-Module Functions

## Init: VrfyCritRegInit1

## Design Rationale

*Refer FDD*

## Module Outputs

*None*

## Per: VrfyCritRegPer1

## Design Rationale

Refer FDD

## Store Module Inputs to Local copies

*None*

## (Processing of function)………

*Refer FDD*

## Store Local copy of outputs into Module Outputs

*None*

## Per: VrfyCritRegPer2

## Design Rationale

Refer FDD

## Store Module Inputs to Local copies

*None*

## (Processing of function)………

*Refer FDD*

## Store Local copy of outputs into Module Outputs

*None*

## Server Runables: MCalReadVrfyFailFltInfo\_Oper

## Design Rationale

Refer FDD

## Store Module Inputs to Local copies

*None*

## (Processing of function)………

*Refer FDD*

## Store Local copy of outputs into Module Outputs

*None*

## Interrupt Functions

*None*

## Module Internal (Local) Functions

## Local Function #1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Function Name** | SysCritReg<Register Short Name>IninChk | Type | Min | | Max |
| **Arguments Passed** | NA |  |  |  | |
| **Return Value** | &SysRegsOk\_Uls\_T\_lgc | boolean | FALSE | TRUE | |

## Description

Set ' SysRegsOk\_Uls\_T\_lgc to FALSE if CPU System Register values are not equal to expected values. This is configured to be called from trusted function because it needs to run in supervisor mode

## Local Function #2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Function Name** | SysCritReg<Register Short Name>PerChk | Type | Min | | Max |
| **Arguments Passed** | NA |  |  |  | |
| **Return Value** | &SysRegsOk\_Uls\_T\_lgc | boolean | FALSE | TRUE | |

## Description

Set ' SysRegsOk\_Uls\_T\_lgc to FALSE if CPU System Register values are not equal to expected values. This is configured to be called from trusted function because it needs to run in supervisor mode

## GLOBAL Function/Macro Definitions

## Global Function #1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Function Name** | CritRegPerChk | Type | Min | | Max |
| **Arguments Passed** | NA |  |  |  | |
| **Return Value** | NtcParamInfo\_Cnt\_T\_u08 | uint8 | 0U | 2U | |

## Description

Set ' NtcParamInfo\_Cnt\_T\_u08 to 1 if CPU Non System Register values are not equal to expected values. Set ' NtcParamInfo\_Cnt\_T\_u08 to 2 if CPU System Register values are not equal to expected values. Set ' NtcParamInfo\_Cnt\_T\_u08 to 0 if none of the above conditions are true. This is configured as a trusted function because it needs to run in supervisor mode

## Global Function #2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Function Name** | CritRegInitChk | Type | Min | | Max |
| **Arguments Passed** | NA |  |  |  | |
| **Return Value** | NtcParamInfo\_Cnt\_T\_u08 | uint8 | 0U | 2U | |

## Description

Set ' NtcParamInfo\_Cnt\_T\_u08 to 1 if CPU Non System Register values are not equal to expected values. Set ' NtcParamInfo\_Cnt\_T\_u08 to 2 if CPU System Register values are not equal to expected values. Set ' NtcParamInfo\_Cnt\_T\_u08 to 0 if none of the above conditions are true. This is configured as a trusted function because it needs to run in supervisor mode

## Global Function #3

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Function Name** | SysCritRegIninChk | Type | Min | | Max |
| **Arguments Passed** | NA |  |  |  | |
| **Return Value** | SysRegsOk\_Uls\_T\_lgc | boolean | FALSE | TRUE | |

## Description

Set ' SysRegsOk\_Uls\_T\_lgc to FALSE if CPU System Register values are not equal to expected values. This is configured to be called from trusted function because it needs to run in supervisor mode

## Global Function #4

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Function Name** | SysCritRegPerChk | Type | Min | | Max |
| **Arguments Passed** | NA |  |  |  | |
| **Return Value** | SysRegsOk\_Uls\_T\_lgc | boolean | FALSE | TRUE | |

## Description

Set ' SysRegsOk\_Uls\_T\_lgc to FALSE if CPU System Register values are not equal to expected values. This is configured to be called from trusted function because it needs to run in supervisor mode

# Known Limitations with Design

# UNIT TEST CONSIDERATION

None

Abbreviations and Acronyms

| **Abbreviation or Acronym** | **Description** |
| --- | --- |
|  |  |
|  |  |

Glossary

**Note**: Terms and definitions from the source “Nexteer Automotive” take precedence over all other definitions of the same term. Terms and definitions from the source “Nexteer Automotive” are formulated from multiple sources, including the following:

* ISO 9000
* ISO/IEC 12207
* ISO/IEC 15504
* Automotive SPICE® Process Reference Model (PRM)
* Automotive SPICE® Process Assessment Model (PAM)
* ISO/IEC 15288
* ISO 26262
* IEEE Standards
* SWEBOK
* PMBOK
* Existing Nexteer Automotive documentation

| **Term** | **Definition** | **Source** |
| --- | --- | --- |
| MDD | Module Design Document |  |
| DFD | Data Flow Diagram |  |

References

| **Ref. #** | **Title** | **Version** |
| --- | --- | --- |
| 1 | AUTOSAR Specification of Memory Mapping (Link:[AUTOSAR\_SWS\_MemoryMapping.pdf](http://www.autosar.org/download/R4.0/AUTOSAR_SWS_MemoryMapping.pdf)) | v1.3.0 R4.0 Rev 2 |
| 2 | MDD Guideline | Software Engineering Process 04.04.02 |
| 3 | [Software Naming Conventions.doc](http://misagweb01.nexteer.com/eRoomReq/Files/erooms8/NextGeneration/0_fc55f/Software%20Naming%20Conventions%2003x(In%20Work).doc) | Software Engineering Process 04.04.02 |
| 4 | [Software Design and Coding Standards.doc](http://eroom1.nexteer.com/eRoomReq/Files/erooms8/NextGeneration/0_1a67a9/Software%20Design%20and%20Coding%20Standards.doc) | Software Engineering Process 04.04.02 |
| 5 | FDD : CM111A\_VrfyCritReg\_Design | See Synergy sub project version |