**DIPLOMADO EN SOFTWARE EMBEBIDO**

**PROYECTO INTEGRADOR**

**SYS.1 Redacción de Requisitos**

|  |  |  |  |
| --- | --- | --- | --- |
| ID | Tipo | Descripción | Evidencia |
|  | **Encabezado** | **SYS.1.1 Administración de Riesgos** |  |
| SYS1-001 | Requisito | Los riesgos del proyecto se tendrán que identificar a través de una matriz de riesgos. | (Ejemplo: Archivo “Matriz de Riesgos.xlsx”) |
| SYS1-002 | Requisito | Para cada riesgo, se deberá identificar su ocurrencia y su nivel de criticidad para la finalización del proyecto. |  |
|  | **Encabezado** | **SYS.1.2 Mitigación de Riesgos** |  |
| SYS1-003 | Requisito | Cada riesgo deberá tener asignada una acción para mitigarlo o controlarlo. |  |
| SYS1-004 | Requisito | Cada riesgo deberá tener asignado un responsable. |  |
| SYS1-005 | Requisito | Cada riesgo identificará las áreas afectadas del proyecto. |  |
| SYS1-006 | Requisito | Cada riesgo deberá tener indicado su estatus, el cual puede ser uno de los siguientes:   * Monitoreado * Mitigado * Controlado * Resuelto   Así mismo, se deberá especificar la resolución para el riego. |  |
| SYS1-007 | Requisito | Los riesgos deberán ser monitoreados cada semana y deberán indicar la última fecha de monitoreo. |  |
|  | **Encabezado** | **SYS.1.3 Registro de Comunicación** |  |
| SYS1-008 | Requisito | La comunicación con el cliente para discutir avances, cambios en el proyecto (entre otros), se registrará a través de minutas. |  |
|  | **Encabezado** | **SYS.1.4 Revisiones** |  |
| SYS1-009 | Requisito | Para las revisiones de sistema y de software, se deberá especificar lo que se revisará, quién será designado como revisor y el estatus de la revisión. |  |
| SYS1-010 | Requisito | Para las revisiones de sistema, se utilizará (el siguiente estándar/la siguiente lista/el siguiente criterio): |  |
| SYS1-011 | Requisito | Para las revisiones de software, se utilizará (el siguiente estándar/la siguiente lista/el siguiente criterio): |  |
| SYS1-012 | Requisito | Se deberá llevar un registro de las fechas en las que se lleva a cabo la revisión. |  |
| SYS1-013 | Requisito | Las correcciones que se deriven de las revisiones deberán indicar lo siguiente:   * Acciones para llevar a cabo la corrección * Responsable de la corrección * Fecha para completar la corrección |  |
|  | **Encabezado** | **SYS.1.5 Control de Cambios** |  |
| SYS1-014 | Requisito | Los cambios solicitados por el cliente en hardware, software o documentación deberán identificar lo siguiente:   * Sistema o documento impactado por el cambio. * Persona que solicitó el cambio. * Persona responsable de realizar el cambio. * Estatus del cambio. |  |
|  | **Encabezado** | **SYS.1.6 Análisis del Proyecto** |  |
| SYS1-015 | Requisito | Se deberá registrar el análisis realizado para tomar decisiones que impacten al proyecto. |  |
| SYS1-016 | Requisito | La documentación del análisis realizado deberá contener lo siguiente:   * Resultado del análisis * Sustento de la decisión * Riesgos potenciales |  |
|  | **Encabezado** | **SYS.1.7 Requisitos del Cliente** |  |
|  | Informativo | Se controlará la velocidad de un motor de corriente directa mediante la aplicación de una señal cuadrada que varía en su ancho de pulso y cuya frecuencia de trabajo será fija. |  |
| SYS1-017 | Requisito | El módulo de potencia a utilizar será el CESEQ-C001 |  |
| SYS1-018 | Requisito | El módulo a controlar será CESEQ-P001 |  |
|  | Informativo | El proyecto se comenzará a trabajar el 22 de Marzo de 2019. |  |
|  | Informativo | El proyecto se completará el 31 de Julio de 2019. |  |
| SYS1-019 | Requisito | El dispositivo de control será el siguiente: Tarjeta YSSKS7G2E30 de RENESAS |  |
| SYS1-020 | Requisito | El dispositivo HMI será el siguiente: 320x240, 24” |  |
| SYS1-021 | Requisito | Durante el proyecto se deberá utilizar la metodología AGILE. |  |

**SYS.2 Análisis de Requisitos**

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| --- | --- | --- | --- |
| ID | Tipo | Descripción | Evidencia |
|  | **Encabezado** | **SYS.2.1 Registro de Comunicación** |  |
| SYS2-001 | Requisito | Referirse al requerimiento <SYS1-008> |  |
|  | **Encabezado** | **SYS.2.2 Control de Cambios** |  |
| SYS2-002 | Requisito | Referirse al requerimiento <SYS1-014> |  |
|  | **Encabezado** | **SYS.2.3 Revisiones** |  |
| SYS2-003 | Requisito | Referirse al requerimiento <SYS1-010> |  |
|  | **Encabezado** | **SYS.2.4 Trazabilidad** |  |
| SYS1-004 | Requisito |  |  |
|  |  |  |  |
| SYS1-002 | Requisito |  |  |

**SYS.2.4 Trazabilidad**

* All requirements (customer and internal) are to be traced
* Identifies a mapping of requirement to life cycle work products
* Provides the linkage of requirements to work product decomposition (i.e., requirement -> design -> code -> test -> deliverables, etc.)

**SYS.2.5 Reporte de Análisis**

* What was analyzed?
* Who did the analysis?
* The analysis criteria used:
  + selection criteria or prioritization scheme used
  + decision criteria
  + quality criteria
* Records the results:
  + what was decided/selected
  + reason for the selection
  + assumptions made
  + potential risks
* Aspects of correctness to analyze include:
  + completeness
  + understandability
  + testability
  + verifiability
  + feasibility
  + validity
  + consistency
  + adequacy of content

**SYS.2.6 Requerimientos de Interfaz**

* Defines relationships between two products, process or process tasks
* Defines criteria and format for what is common to both
* Defines critical timing dependencies or sequence ordering
* Description of the physical interfaces of each system component like
  + Bus interfaces (CAN, MOST, LIN, Flexray etc.)
  + Transceiver (type, manufacturer, etc.)
  + Analogue interfaces
  + Digital interfaces (PWM, I/O)
  + additional interfaces (IEEE, ISO, Bluetooth, USB, etc.)
* Identification of the software interfaces of software components and other software item in terms of
  + Inter-process communication mechanisms
  + Bus communication mechanisms

**SYS.2.7 Requerimientos de Sistema**

* System requirements include: functions and capabilities of the system; business, organizational and user requirements; safety, security, human-factors engineering (ergonomics), interface, operations, and maintenance requirements; design constraints and qualification requirements.
* Identifies the required system overview
* Identifies any interrelationship considerations/constraints between system elements
* Identifies any relationship considerations/constraints between the system elements and the software
* Identifies any design considerations/constraints for each required system element, including:
  + memory/capacity requirements
  + hardware interface requirements
  + user interface requirements
  + external system interface requirements
  + performance requirements
  + command structures
  + security/data protection characteristics
  + system parameter settings
  + manual operations
  + reusable components
* Describes the operation capabilities
* Describes environmental capabilities
* Documentation requirements
* Reliability requirements
* Logistical Requirements
* Describes security requirements
* Diagnosis requirements

**SYS.2.8 Criterios de Verificación**

* Each requirement is verifiable or can be assessed
* Verification criteria define the qualitative and quantitative criteria for verification of a requirement.
* Verification criteria demonstrate that a requirement can be verified within agreed constraints. (Additional Requirement to 17-00 Requirements specification)

**SWE.1 Análisis de Requisitos**

**SWE.1.1 Registro de Comunicación**

* All forms of interpersonal communication including:
  + letters
  + faxes
  + e-mails
  + voice recordings
  + podcast
  + blog
  + videos
  + forum
  + live chat
  + wikis

**SWE.1.2 Revisiones**

* Provides the context information about the review:
  + what was reviewed
  + lists reviewers who attended
  + status of the review
* Provides information about the coverage of the review:
  + check-lists
  + review criteria
  + requirements
  + compliance to standards
* Records information about:
  + the readiness for the review
  + preparation time spent for the review
  + time spent in the review
  + reviewers, roles and expertise
* Review findings:
  + non-conformances
  + improvement suggestions
* Identifies the required corrective actions:
  + risk identification
  + prioritized list of deviations and problems discovered
  + the actions, tasks to be performed to fix the problem
  + ownership for corrective action
  + status and target closure dates for identified problems

**SWE.1.3 Control de Cambios**

* Used as a mechanism to control change to baselined
* products/products in official project release libraries
* Record of the change requested and made to a baselined product (work products, software, customer documentation, etc.):
  + identification of system, documents impacted with change
  + identification of change requester
  + identification of party responsible for the change
  + identification of status of the change
* Linkage to associated customer requests, internal change requests, etc.
* Appropriate approvals
* Duplicate requests are identified and grouped

**SWE.1.4 Trazabilidad**

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**SWE.1.5 Reporte de Análisis**

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* Identification of the software interfaces of software components and other software item in terms of
  + Inter-process communication mechanisms
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**SWE.1.7 Requerimientos de Software**

* Identifies standards to be used
* Identifies any software structure considerations/constraints
* Identifies the required software elements
* Identifies the relationship between software elements
* Consideration is given to:
  + any required software performance characteristics
  + any required software interfaces
  + any required security characteristics required
  + any database design requirements
  + any required error handling and recovery attributes
  + any required resource consumption characteristics

