**DIPLOMADO EN SOFTWARE EMBEBIDO**

**PROYECTO INTEGRADOR**

**SYS.1 Redacción de Requisitos**

**SYS.1.1 Administración de Riesgos**

* Project risks identified and prioritized
* Mechanism to track the risk
* Threshold criteria to identify when corrective action required
* Proposed ways to mitigate risks:
  + risk mitigator
  + work around
  + corrective actions activities/tasks
  + monitoring criteria
  + mechanisms to measure risk

**SYS.1.2 Mitigación de Riesgos**

* Planned risk treatment activities and tasks:
  + describes the specifics of the risk treatment selected for a risk or combination of risks found to be unacceptable
  + describes any difficulties that may be found in implementing the treatment
* Treatment schedule
* Treatment resources and their allocation
* Responsibilities and authority:
  + describes who is responsible for ensuring that the treatment is being implemented and their authority
* Treatment control measures:
  + defines the measures that will be used to evaluate the effectiveness of the risk treatment
* Treatment cost
* Interfaces among parties involved:
  + describes any coordination among stakeholders or with the project’s master plan that must occur for the treatment to be properly implemented
* Environment/infrastructure:
  + describes any environmental or infrastructure requirements or impacts (e.g., safety or security impacts that the treatment may have)
* Risk treatment plan change procedures and history

**SYS.1.3 Registro de Comunicación**

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

**SYS.1.4 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

**SYS.1.5 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

**SYS.1.6 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.1.7 Requerimientos del Cliente**

* Purpose/objectives defined
* Includes issues/requirements from (contract) reviews
* Identifies any:
  + time schedule/constraints
  + required feature and functional characteristics
  + necessary performance considerations/constraints
  + necessary internal/external interface considerations/constraints
  + required system characteristics/constraints
  + human engineering considerations/constraints
  + security considerations/constraints
  + environmental considerations/constraints
  + operational considerations/constraints
  + maintenance considerations/constraints
  + installation considerations/constraints
  + support considerations/constraints
  + design constraints
  + safety/reliability considerations/constraints
  + quality requirements/expectations

**SYS.2 Análisis de Requisitos**

**SYS.2.1 Registro de Comunicación**

* All forms of interpersonal communication including:
  + letters
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**SYS.2.2 Control de Cambios**

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**SYS.2.3 Revisiones**

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* 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

**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:
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  + feasibility
  + validity
  + consistency
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**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**

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**SWE.1.2 Revisiones**

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**SWE.1.4 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.)

**SWE.1.5 Reporte de Análisis**

* What was analyzed?
* Who did the analysis?
* The analysis criteria used:
  + selection criteria or prioritization scheme used
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  + quality criteria
* Records the results:
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  + 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

**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

