

R1 - Software Requirements Checklist (JPL)

CLARITY

1. Are the goals of the subsystem defined?
2. Is the terminology consistent with the users' and/or sponsors' terminology?
3. Are the requirements clear and unambiguous?
4. Is a functional overview of the program set provided?
5. Is an overview of the operational modes, states, and concept described?
6. Have the software environment (co-resident program sets) and hardware environment (specific configurations) been specified?
7. If assumptions that affect implementation have been made, are they stated?
8. Have the requirements been stated in terms of inputs, outputs, and processing for each function?

COMPLETENESS

1. Are required attributes, assumptions, and constraints of the program set completely listed?
2. Have all requirements and constraints been assigned a priority?
3. Have the criteria for assigning requirement priority levels been defined?
4. Have the requirements been stated for each delivery or staged implementation?
5. Have requirements for installation (packaging, site preparation, operator training) been specified?
6. Have the target language, development environment, and run-time environment been chosen?

COMPLIANCE

1. Does the documentation follow project and/or JPL standards?

CONSISTENCY

1. Are the requirements mutually consistent?
2. Are the requirements in this document consistent with the requirements in related documents?
3. Are the requirements consistent with the actual operating environment (e.g., check hardware timing, precision, event sequencing, data rates, bandwidth)?
4. Do the requirements stay within the capability of the requirements allocated by the FDD?

CORRECTNESS

1. Do the requirements seem feasible with respect to cost, schedule, and technology?
2. Are the requirements consistent with the actual operating environment (e.g., hardware timing, precision, event sequencing, data rates, bandwidth)?

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DATA USAGE

1. Have the data type, rate, units, accuracy, resolution, limits, range, and critical values for all internal data items been specified?
2. Have the data objects and their component parts been specified?
3. Has the mapping between local views of data and global data been shown?
4. Has the management of stored and shared data been described?
5. Has a list of functions that set and/or use stored and shared data been provided?
6. Are there any special integrity requirements on the stored data?
7. Have the types and frequency of occurrence of operations on stored data (e.g., retrieve, store, modify, delete) been specified?
8. Have the modes of access (e.g., random, sequential) for the shared data been specified?

FUNCTIONALITY

1. Are all described functions necessary and sufficient to meet the mission/system objectives?
2. Are all inputs to a function necessary and sufficient to perform the required operation?
3. Does each function clearly describe how outputs (and shared data) are generated from inputs (and shared data)?
4. Are all function states defined?

INTERFACE

1. Are the inputs and outputs for all the interfaces sufficient and necessary?
2. Are all the outputs produced by a function used by another function or transferred across an external interface?
3. Are the interface requirements between hardware, software, personnel, and procedures included?
4. Have the contents, formats, and constraints of all the displays been described in the SRD or Software Operator's Manual (SOM-1)?
5. Are all data elements crossing program set boundaries identified?
6. Are all data elements described here or in the SIS-1?
7. Has the data flow between internal software functions been represented?

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LEVEL OF DETAIL

1. Are the requirements free of design?
2. Have all "TBDs" been resolved?
3. Have the interfaces been described to enough detail for design work to begin?
4. Have the accuracy, precision, range, type, rate, units, frequency, and volume of inputs and outputs been specified for each function?
5. Have the functional requirements been described to enough detail for design work to begin?
6. Have the performance requirements been described to enough detail for design work to begin?

MAINTAINABILITY

1. Are the requirements weakly coupled (i.e., changing a function will not have adverse and unexpected effects throughout the subsystem)?
2. Will the requirements minimize the complexity of the design?
3. Have FRD and FDD maintainability requirements been levied to functions?
4. Have FRD and FDD portability requirements been levied to functions?
5. Has the use of inherited design or code or pre-selected tools been specified?

PERFORMANCE

1. Have the FRD and FDD performance requirements been allocated to each function?
2. Have the resource and performance margin requirements been stated along with the means for managing them?

RELIABILITY

1. Have quality factors been specified as measurable requirements or prioritized design goals?
2. Have FRD and FDD reliability requirements been levied to functions?
3. Have FRD and FDD availability requirements been levied to functions?
4. Have FRD and FDD security/safety requirements been levied to functions?
5. Are error checking and recovery required?
6. Are undesired events considered and their required responses specified?
7. Are initial or special states considered (e.g., cold starts, abnormal termination)?
8. Have assumptions about intended sequences of functions been stated? Are these sequences required?

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TESTABILITY

1. Can the program set be tested, demonstrated, analyzed, or inspected to show that it satisfies the requirements?
2. Are the individual requirements stated so that they are discrete, unambiguous, and testable?
3. Have the overall program set acceptance criteria been established?
4. Have clear pass/fail criteria for the acceptance tests been established?
5. Have the test methods (test, demonstration, analysis, or inspection) been stated for each requirement?

TRACEABILITY

1. Are all functions, structures, and constraints traced to requirements, and vice versa?
2. Have the FDD and Integrated Software Functional Diagram (ISFD) requirements been allocated to functions of the program set?
3. Do the requirements (or traceability matrix) indicate whether they are imposed by the FDD or whether they are derived to support specific FDD requirements?
4. Have the FRD, FDD, and any derived design goals and implementation constraints been specified and prioritized?
5. Is each requirement stated in a manner that it can be uniquely referenced in subordinate documents?