

SUMMARY POLICY ISSUE PAPER – FOR EDAG DISCUSSION

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| Title of Paper | Switching Programme System Integration Strategy | | |
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Summary and recommendations

1. This paper describes the proposed System Integration strategy for the new switching arrangements which will enable gas and electricity consumers achieve faster, more reliable switching.
2. The purpose of system integration is to plan for and then manage and co-ordinate the activities and resources required to ensure that the component parts of the whole switching system are designed, built, assembled, tested and accepted in controlled and progressive way that prepares the whole system for final validation and transition into live operations. In particular, it should ensure that cross-interface and cross-party design issues and defects are identified and resolved as early as possible.
3. The aim of a System Integration function should be to significantly de-risk the later stages of Design, Build and Test (DBT) and hence save time and cost by ensuring that individual parties are managed and co-ordinated as one team. This is achieved by effective co-ordination and oversight of DBT activity across all parties; early identification and mitigation of integration risks using appropriate approaches and techniques; providing greater assurance that all parties and the parts of the system they are responsible for are ready for planned integration and testing; and effective management and execution of integration and testing across parties.
4. The System Integration strategy identifies what System Integration activities are and how these might be implemented during the DBT phase of the programme, assessing options for bodies or parties that might fulfil these functions, with reference to best practice across other systems.
5. A full list of recommendations is found on pages 35 to 37 of the Issues document. Our key recommendation is that, if a CRS is a component part of the Switching programme, a System Integration strategy should be developed, and an independent, specialist system integrator body should be appointed to plan, manage and undertake System Integration roles and approaches in line with this strategy. This system integrator would ideally be appointed during the Detailed Level Specification (DLS) phase.

6. Detailed approaches for System Integration should be developed in the DLS phase as part of the System Integration Management Plan once the final solution architecture is chosen and the detailed level specification is developed.
7. Please note: System Integration activity can be conducted by a designated individual party separately from other programme functions, or a System Integration role could be performed by an appropriately resourced party from within the programme. For convenience, when we refer to a System Integration function below, either case could apply, depending on the final design of the function.
8. Our questions for consideration at EDAG are:
 - Do you agree that a designated System Integration function should be created within the programme?
 - Do you think that this should be a standalone function, or could it be operated by an existing participant within the Switching Programme and still maintain an appropriate degree of independence?
 - Have we missed anything in our high-level approach to System Integration?

Background and Analysis

9. Building a complex system like the CRS requires many processes and sub-systems to work in harmony. Unless there is oversight of these systems and sub systems, they may diverge on design or quality or fail to be delivered into a unified system in good time. This can be costly and time consuming to correct. Effective System Integration can reduce the risk of such timing and specification mismatches.
10. It is important to note that the role of a System Integration function will include co-ordination of parties and sub-systems which sit outside the design of the switching solution architecture itself. This will include ensuring that parties who will use and otherwise interact with the switching solution, upon whom the solution relies for its effectiveness, are ready to deliver a product of an appropriate quality.

Experience of other projects

11. The importance of a System Integration function is highlighted by the Smart Meter Implementation Programm (SMIP) and Project Nexus. A System Integration function within SMIP is undertaken by the Data Services Provider (DSP) under DCC assurance, but its remit only extended to services designed by DCC and not to the whole solution. When interface and integration issues occurred during Systems Integration Testing (SIT), DCC and the DSP were required to deploy additional resource to overcome these challenges.
12. In the case of Project Nexus , no dedicated systems integration role was included in the programme, meaning that and many issues only emerged late in testing (market trial) with many parties not being ready and hence designs not being stable. The recent assurance review undertaken by PwC states: "The issues that have contributed to this [lack of progress in testing] position have included 'blocking' defects that have halted, and in some cases, continue to halt the efficient execution

of end-to-end test scenarios [and] the complex coordination of testing across participants for certain scenarios such as Change of Ownership ('CoO').

Interaction with other aspects of the programme

13. System Integration is closely linked with testing and design management. A System Integration function must be aligned with the overall testing strategy for the project, and both the respective strategies and plans should be aligned in how they identify, plan for and mitigate design risks. Test execution and management for cross-party testing should be part of the role of a System Integration function. With this in mind, if a System Integration function is adopted within the programme, it must be developed in step with the Testing Strategy, particularly in the later stages of programme delivery.
14. The System Integration function may also be well placed to provide direct support to processes managing design of the solution architecture. This may include investigating issues and defects and recommending resolutions for approval. This capacity is enhanced if the System Integration function is independent of other parts of programme delivery.

System Integration documentation

15. The approach taken to System Integration is dependent on the architecture of the system and relies on the way this has been designed. With this in mind, the strategy is then enacted through an integration plan that defines:
 - The minimum configuration/readiness of expected system components or sub-systems;
 - Their order of assembly and aggregation in order to support efficient subsequent testing and other verification validation actions (e.g. trials);
 - The approaches to be adopted to check, evaluate and de-risk interfaces, including the provision of the necessary capabilities in the integration environment to support this process.
16. The process of creating a System Integration strategy usually starts with the selected testing strategy and needs to be closely aligned to it. The System Integration strategy sets the overall approach to System Integration, the main activities and associated roles and responsibilities. It is vital that a System Integration strategy is established early in the programme to ensure that an appropriate level of System Integration activity is planned for throughout the programme.

Proposed roles within the SI function

17. Key roles that should be undertaken by the System Integration function are (a fuller list is included on page 24 of the Issues Document):
 - Development of a Management Plan for System Integration;
 - Developing and implementing a range of appropriate integration approaches and techniques to mitigate the integration/interface risks identified during DLS;

- Managing and assuring design, build and test of components and sub-system elements by individual parties and hence ensuring their 'readiness' for integration and testing;
- Combining components and sub-systems into logical 'aggregates' (and management and execution of testing at cross-party levels), to reflect best practice in project management and testing;
- Managing and investigating cross-party defects/issues; support to associated change evaluation and configuration management at system level;
- Ensuring accurate, up-to-date and shared DBT knowledge across all relevant parties.

18. In effect, the System Integration function will provide support and advice to the Design Authority on the overall programme. The Design Authority will remain accountable for most of the activities undertaken by the System Integration function.

Related Issues

19. In addition to the Testing Strategy work package, as identified above, there are many other interdependent areas with the System Integration Strategy in the context of the programme. The key areas are:

20. **Choice and design of solution architecture.** The extent of change involved in the building the switching solution and the final design will affect the complexity and risk and the absolute need for a System Integration function. If a 'do nothing' or 'do minimum' solution is adopted, a separate System Integration function may be unnecessary.

21. **Transition strategy.** The chosen strategy for moving from the existing switching arrangements to the new solution will affect how the integration of system components will be undertaken, and will therefore be crucial to understand how the System Integration function will be conducted.

22. **Governance and Assurance in the Design, Build and Test phase and immediate post-implementation period.** The System Integration roles and responsibilities will need to be clearly defined alongside other aspects of governance within the Design, Build and Test phase of the Programme.