



Case Study: Agile IV&V at the Nuclear Regulatory Commission (NRC)

The Challenge

AEGIS was tasked with conducting IV&V of an agile software development effort because the NRC had recently transformed to an agile development approach. The NRC had a long history (over 15 years) of comprehensive IV&V as part of their software integration process and asked AEGIS, as the NRC's IV&V contractors, to align an IV&V program with agile to optimize the benefits of both independent reviews and agile principles.

Our Approach

Integrate. One member of the IV&V team was embedded with an agile development team. The IV&V team member acted as an extra tester with knowledge of the business who is less focused on the technical aspects and more on the users' point of view. But this is key: this embedded tester was a fully qualified sprint team member able to keep pace with the rest of the team at all times. In this way, IV&V provided an even tighter feedback loop for the developers than the sprint demos because feedback occurred within the sprint at or near real-time. The IV&V team member was also responsible for providing a sprint report to the product owner to aid him/her in decision making, prioritization, story selection, etc. Finally, the embedded team member was the liaison to the rest of the IV&V team for nitty-gritty questions.

Collaborate. IV&V was comprised of several team members allowing us to divide and conquer by:

- Covering a multitude of meetings and stakeholder interactions, sometimes simultaneously
- Having more than one interpretation of the requirements (and then finding the truth)
- Sharing research tasks when, as often happens in IV&V, workload surges

Remain Steadfastly Independent. Independence is critical for two reasons:

1. There's no reason not to be forthcoming to the developers with any concerns. An independent tester does not have the same potential concern a tester on the developer's / integrator's payroll might have with "rocking the boat".
2. There's no reason not to be forthcoming to the product owner (NRC) with any concerns. An IV&V team member has full view into the development process so, if something is going wrong, there is full transparency across the team and the agency client.

IV&V Lessons Learned

- Even well into the Age of Agile the government may still want all of the testing documentation that they're accustomed to. It turns out that does not conflict with Agile. The government derives value from that documentation, and agile's core objective is to deliver value to users. We developed a plan to provide maximum NRC comfort with less overall documentation and minimal impact on development team momentum by allowing IV&V to be the integration layer between the development team's process and the NRC's desire for documentation.
- The feedback shortening benefit works both ways - the embedded tester's knowledge of the new system brings a benefit to standard validation testing. This is visible through less question volleys between the IV&V and dev teams.



A E G I S

- It can be easy to get bogged down in the fact that you're testing. You can report simple bugs if you run into them, but try to stay in your lane: validation.
- It can also get easy to get bogged down in the fact that you're validating. At times it may seem like the users won't like something; however, if it's not strictly against the requirements as they've been recorded, let the agile process work! Let the users see it at the sprint demo and provide their feedback as they see fit.

Recommended IV&V Best Practices

- Adopt the dev team's tools and methods as much as possible/practical (integrate)
- Develop a good relationship with the dev team (collaborate)
- At the same time, don't get too close (remain steadfastly independent)

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