# eVinci™ Microreactor

## NQA Feasibility

## Westinghouse Use of Commercial Grade Dedication-by-Design

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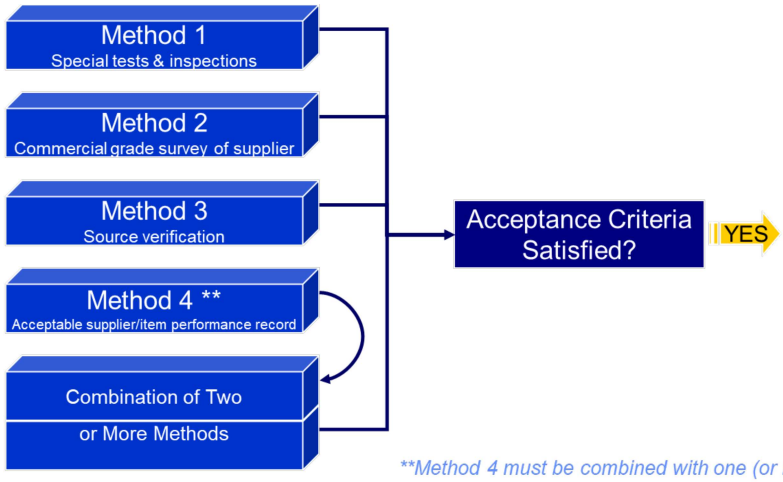
# Why Execute a CGD-by-Design Approach

- The number of NQA-1 vendors has been historically decreasing every year
- Recognized industry challenges on cost to deliver completed projects
- Prevents over-prescription of NQA-1 by suppliers to their materials/parts/processes.
- Reduces supplier risk by providing more detailed instructions beyond the safety functions
  - Especially on FOAK design or manufacturing
- Significantly increases number of available suppliers which drives competition and therefore cost reduction (may eliminate sole source risk)
- Centralization of nuclear quality to the design authority makes the best athlete responsible
  - Better alignment between safety function and critical characteristics

Too good to be true?

- In exchange for these benefits risk is transferred to design authority – who holds the NQA-1 program and CGD process oversight
  - The key mitigation is moving the critical characteristic and acceptance process definition and procurement strategy to **earlier** in the project phase which has secondary benefits also
    - While this increases planned work in the design phases, it significantly reduces fabrication follow engineering and results in procurement savings for a net benefit

# CGD Process



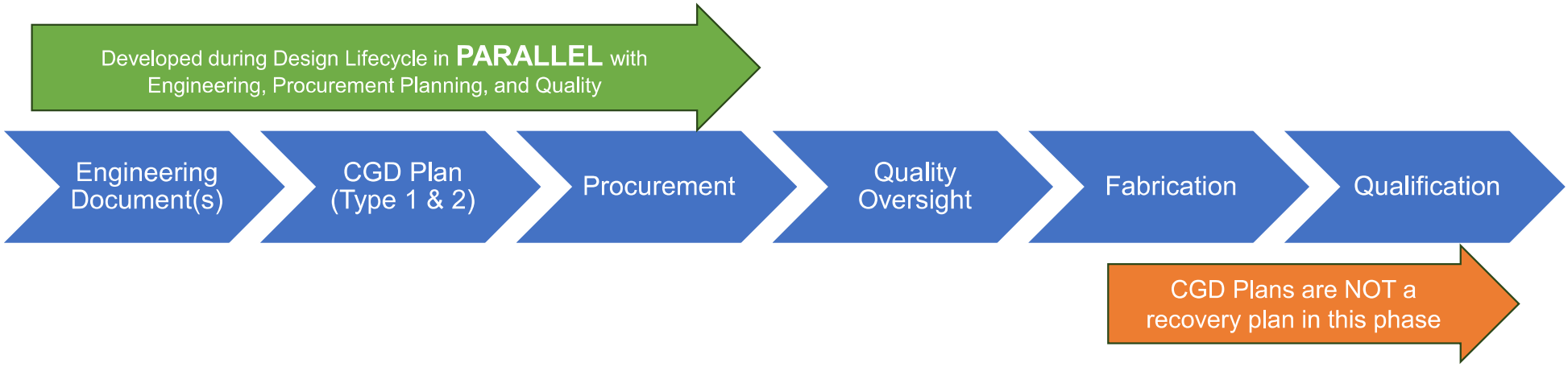

***Method 4 must be combined with one (or more) other methods*



Technical Evaluation → Specification of Acceptance Process → Execution of Acceptance Process (Inspected and Tested) → Dedicated CGI/ Service

# Design, Quality, & Procurement Working Together

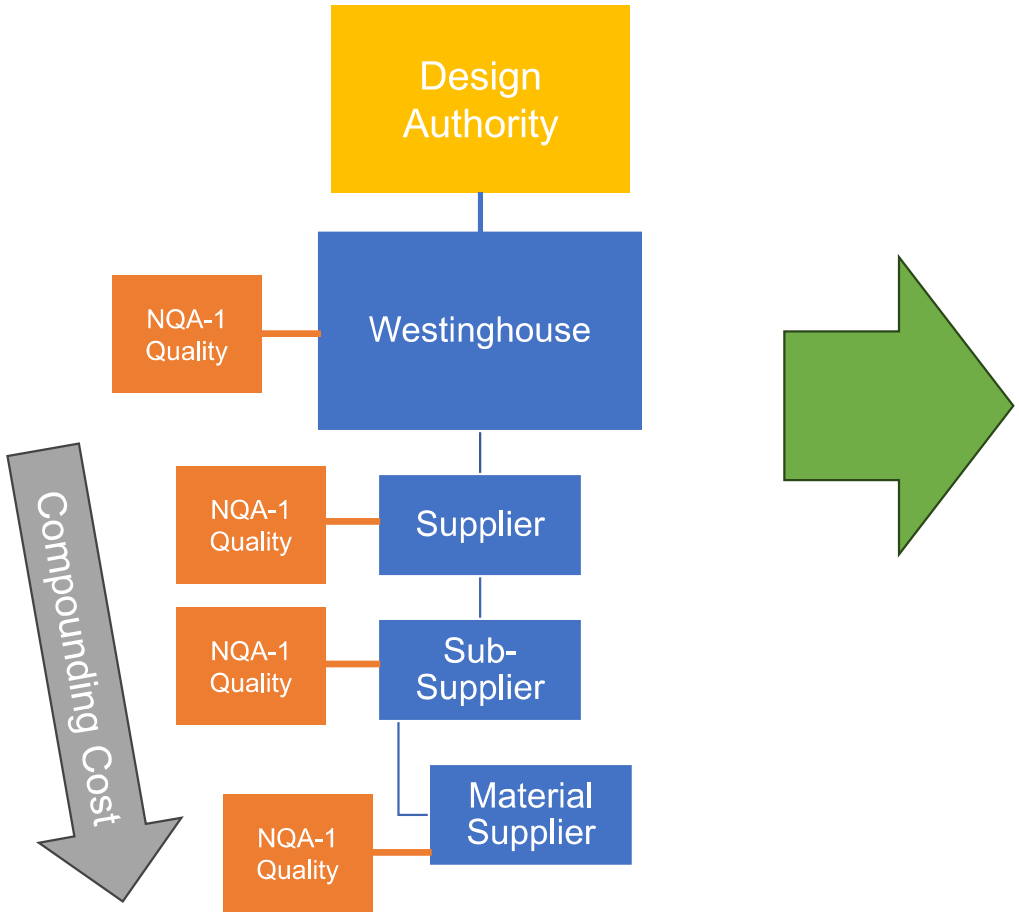
Defining critical characteristics during the design process is a cost and schedule savings as it is inherently incremental during design phase but not incremental during fabrication follow, manufacturing, and construction

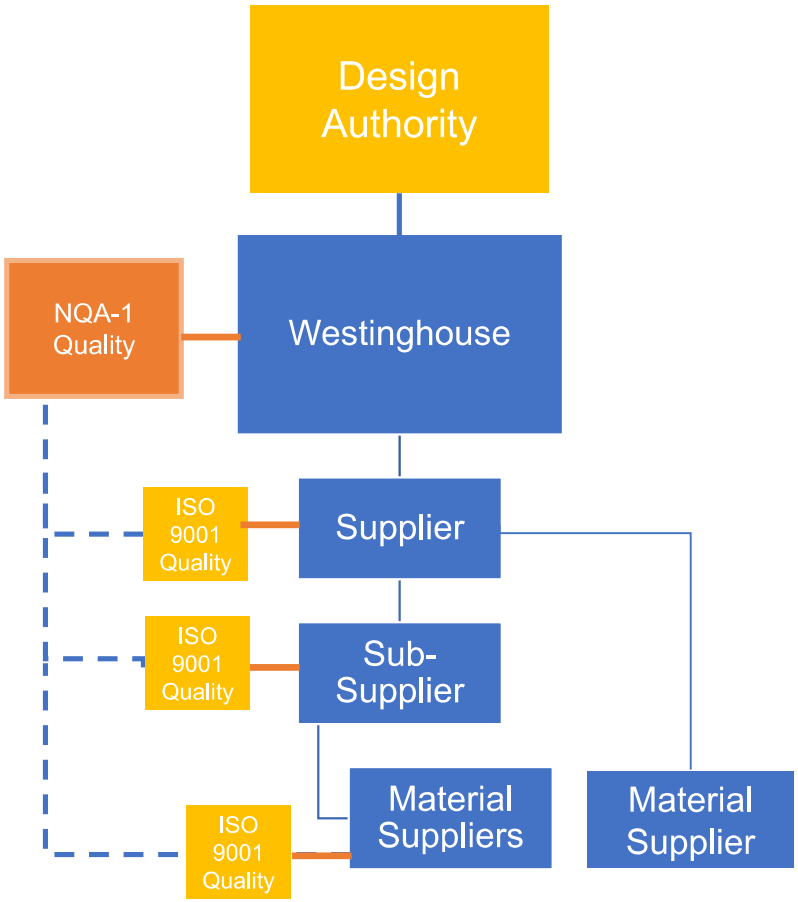



Providing the critical characteristics and acceptance process upfront with the supplier reduces their risk (and therefore their cost in risk/contingency).

- It pre-approves which sub-parts and raw materials the vendor can purchase as non-safety in line with engineering's interpretation of the critical characteristics of the safety function

# Framework of Quality Org for Commercial Construction

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# Impact to Project Engineering

## Build-to-Print

| Documentation (Current) | Documentation (Proposed) |
|---|---|
| Design Spec | Design Spec<br>*- addition of critical characteristics* |
| Manufacturing Spec | Manufacturing Spec |
| Drawings | Drawings |
| Calculations | Calculations |
| | Technical Evaluation |
| | Acceptance Process Spec |
| | Procurement Strategy |

**Build to Print is more easily executed given the tightly coupled work between design, manufacturing, procurement, and quality**

## Spec-Design-Build

| Documentation (Current) | Documentation (Proposed) |
|---|---|
| Design Spec | Design Spec |
| Manufacturing Spec | Manufacturing Spec |
| -- | -- |
| -- | *Technical Evaluation** |
| | *Acceptance Process** |

***In this arrangement, the vendor would be responsible for performing the technical evaluation and acceptance process work in conjunction with Westinghouse Quality**

**Less likely to be able to subcontract as fixed-price during design phase as the scope is not fixed**

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