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Controlling the Turnaround Event Scope "Thinking Beyond the Scope Challenge

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HOUSTON

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Presenter

Frank Engli, P.Eng. is a Senior Maintenance and Turnaround Advisor with Becht and resides in Edmonton, Alberta.

Frank has over 40 years of experience working in operation settings at six different sites across Canada on project, maintenance, HSSE and turnaround management and continuous improvement processes in the energy, refinery, and petrochemical industry. He has extensive expertise in solving site problems and a proven track record to implement change and create sustaining management programs and processes including improved business controls practices and contracts management.

Frank has also built a strong network across North America with external clients, competitors, contractors and building trades and is a sought as a speaker at Canadian and international turnaround and maintenance conferences, webinars, and podcasts. Mr. Engli has engineering and business degrees (B.A.Sc. - Windsor, M.Eng. - Toronto and MBA – Saint Mary's) and is a certified Six Sigma Black Belt practitioner. He is a licensed engineer in provinces of Alberta and Ontario.

Agenda

- Brief Overview of Becht
- The Reason We Care About Scope Control
- The Typical Approach, Using Scope Challenge and Change Control
- Typical Weaknesses With Scope Challenge and Ways to Fix Them
- Typical Weaknesses With Scope Change Control and Ways to Fix Them.
- Conclusion – The Holistic Approach, From Kick-Off to Close-Out

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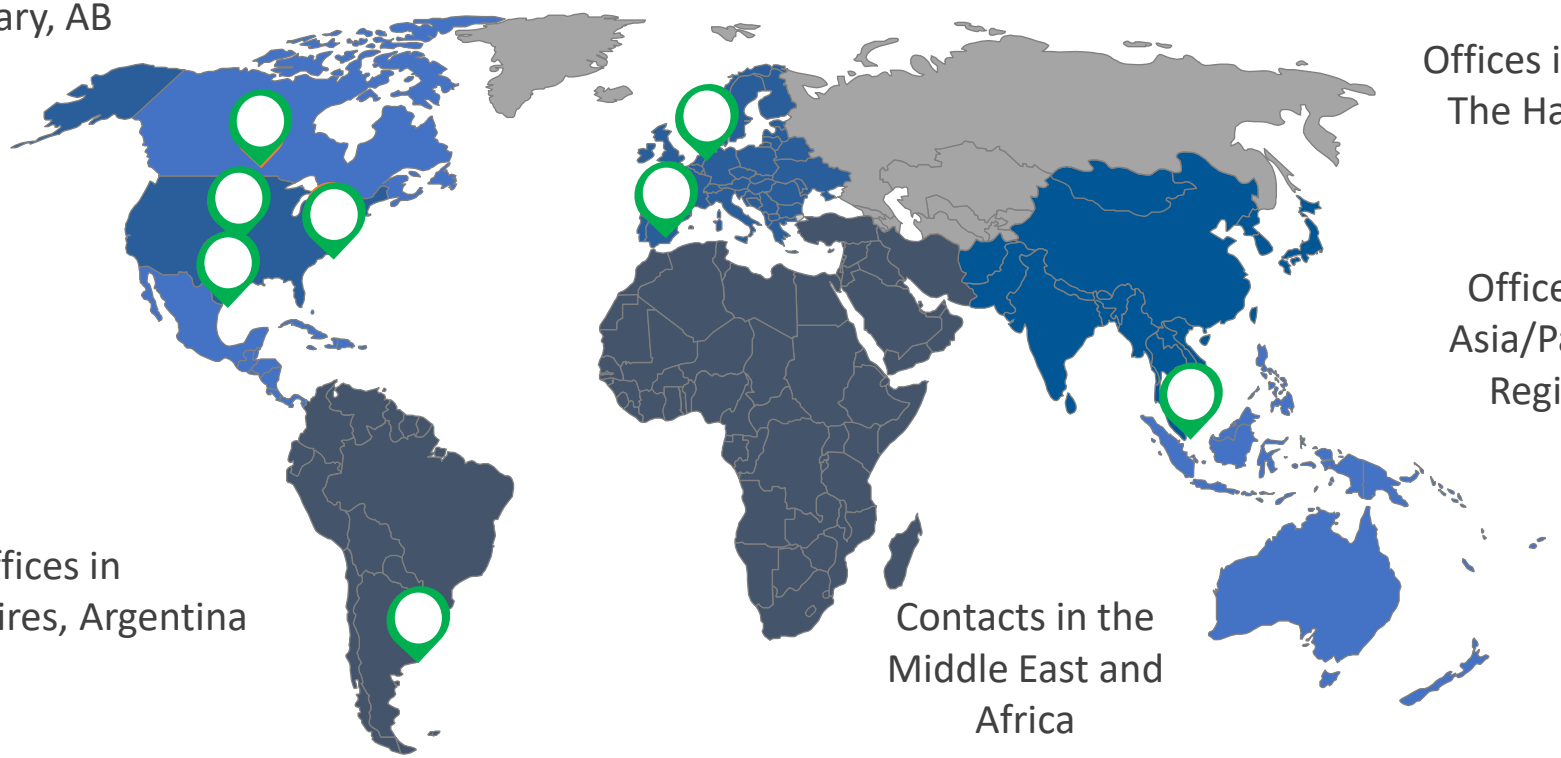

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Reason We Care About Scope Control

Question 1:

Is controlling scope a challenge at your site?

a) Yes
b) No

Reason We Care About Scope Control

Question 2:

Does your site adhere to scope closure dates?

a) Yes
b) No

The Reason We Care About Scope Control

Why Turnaround Event Scope Control is Important!

The Bigger the Scope, the Harder It Is To Manage.

- Numerous studies show that the more scope you need to work on, the higher the risk of cost overrun, schedule overrun and accidents.
- Each site has a natural limit of scope size that the site organization and infrastructure can cope with. If you exceed that limit, the risk of cost overrun, schedule overrun and accidents increases rapidly.

Late Scope Additions Cause Disruption & Extra Preparation Work

- Scope added after the scope freeze disrupts the work package preparation effort, adds more work for the planners and gives them little time in which to prepare it.
- Each late scope addition (and even late scope subtractions) increases the risk of cost overrun, schedule overrun and accidents.
- All scope is the same (projects, MOC's, etc.)

The Typical Approach, Using Scope Challenge and Change Control

The Bigger the Scope, the Harder It Is To Manage.

- Numerous studie[illegible]w that the more scope you nee[illegible]on, the higher the risk of c[illegible]edule overrun and ac[illegible]

Most Site Recognize that you can Control the Overall Scope via:

Scope Challenge
Scope Freeze

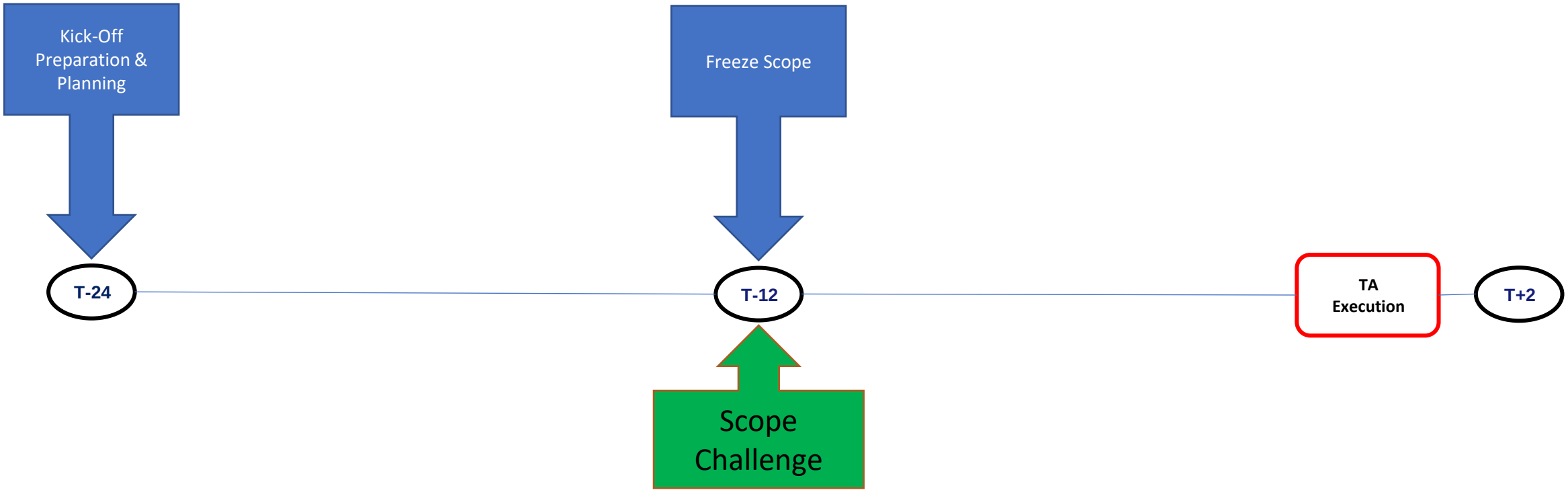
Late Scope Additions Cause Disruption & Extra Preparation Work.

- Scope added aft[illegible]e scope freeze disrupts the w[illegible]ge preparation effort, adds [illegible]the planners and gives then[illegible]ne in which to prepare it

Most Site Recognize that you can Control Late Scope Additions via:

Scope Change Process

Typical Weaknesses With Scope Challenge and Ways To Fix Them



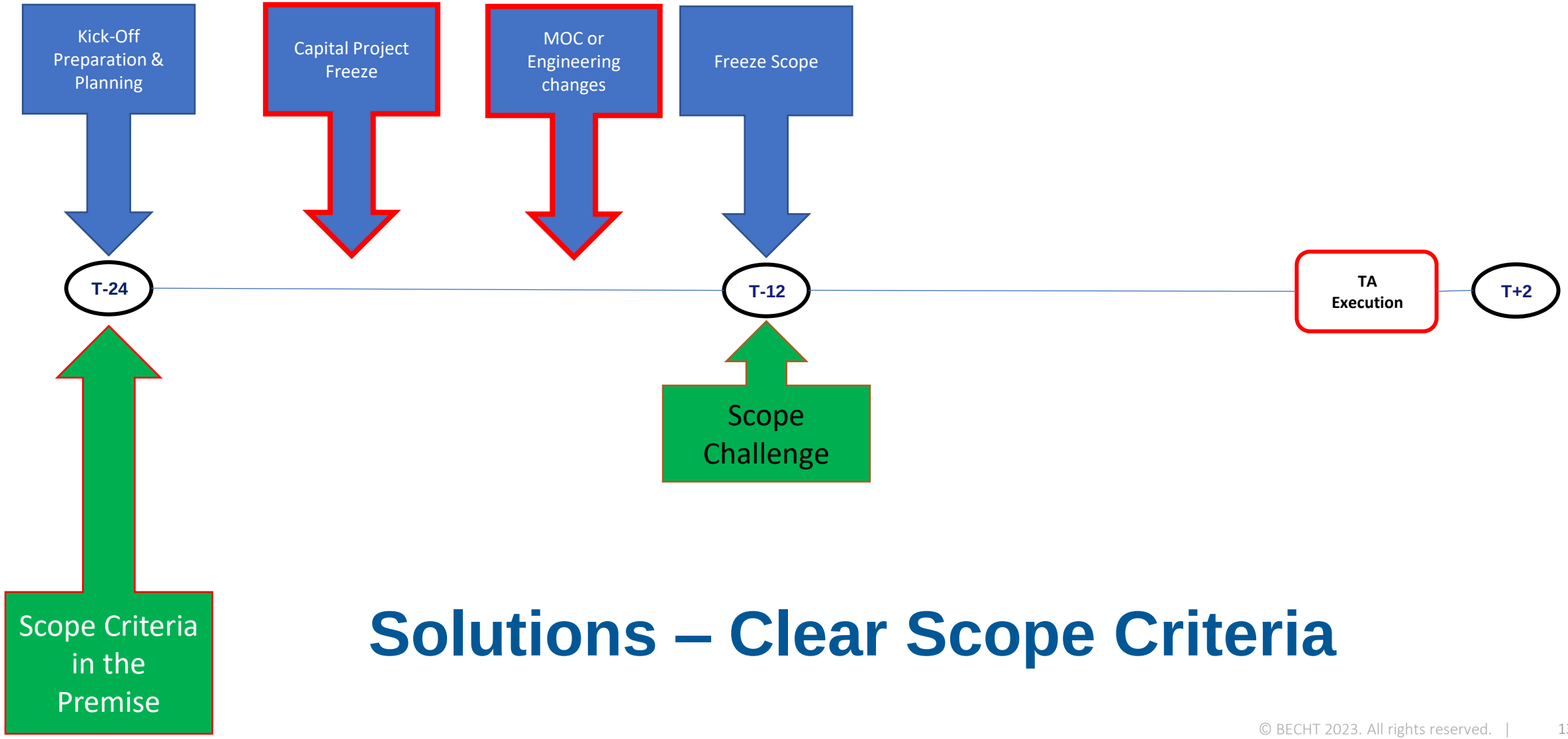
Turnaround Scope Challenge

Typical Weaknesses With Scope Challenge and Ways To Fix Them

Common Problems With Scope Challenge

- The criteria against which to challenge the scope are vague, allowing unnecessary, but desired scope to be included.
- The challenge is qualitative, not quantitative.
- Most challenge scope out vs. why it is a must to do in a turnaround.
- Only part of the scope is challenged.
- All scope is considered the same (Capital Projects, MOC's, etc.)

Typical Weaknesses With Scope Challenge and Ways To Fix Them



Solutions – Clear Scope Criteria

Typical Weaknesses With Scope Challenge and Ways To Fix Them

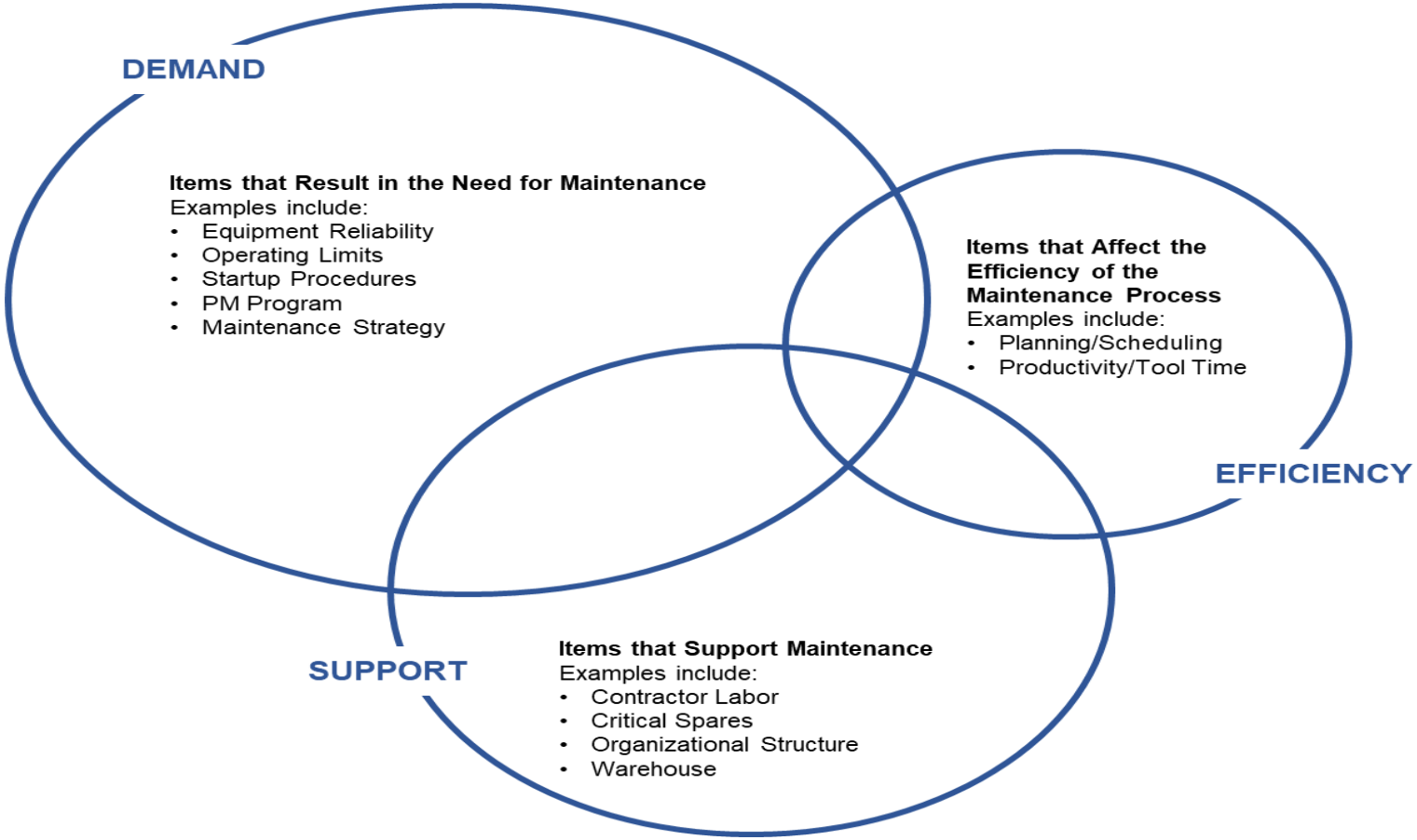
Premise & Scope Inclusion Criteria*

- Many firms approach the scope description element of the premise document by stating WHAT they intend to shutdown.
- We prefer to encourage teams to think about WHY they intend to shutdown, and hence to formulate a description of what the unit should be capable of once the turnaround event is over.
  - "Once the turnaround is complete, we expect that Unit X must be able to run for Y years, at Z throughput, with only AA amount of unplanned shutdown during the Y years."
- Team can then focus on formulating scope inclusion criteria that will help the unit to meet that objective and avoid specifying specific equipment or units. We therefore then move onto specifics for:
  - Retaining the License to Operate for Y more Years
  - Maintaining Production at Z throughput, with AA unplanned shutdown
  - Upgrading the Unit to meet the site long range plan
  - Timeline required to define, fund, develop and procure (tie-ins, start-up ready)
  - Clear funding and hurdle rates defined
- After that, we move to general scope inclusion criteria, such as:
  - Whether the work could be done "on-the-run"
- With clear scope inclusion criteria in place, the Scope Challenge workshop now has firm rules on which to challenge scope and the Scope Change Control process has firm rules on what scope can be considered.

** For more on this, see this article by Becht consultant, Gordon Lawrence: https://becht.com/becht-blog/entry/turnaround-scope-optimization/*

Typical Weaknesses With Scope Challenge and Ways To Fix Them

Drivers of Maintenance Value



From Benchmarking within the Oil and Gas Industry, the contributions of the various drivers to maintenance value (measured by total cost) are:

- Demand – approximately 60%
- Support – approximately 20-30%
- Efficiency – approximately 10-20%

Many organizations focus on the Efficiency driver without realizing they are attacking the smallest driver

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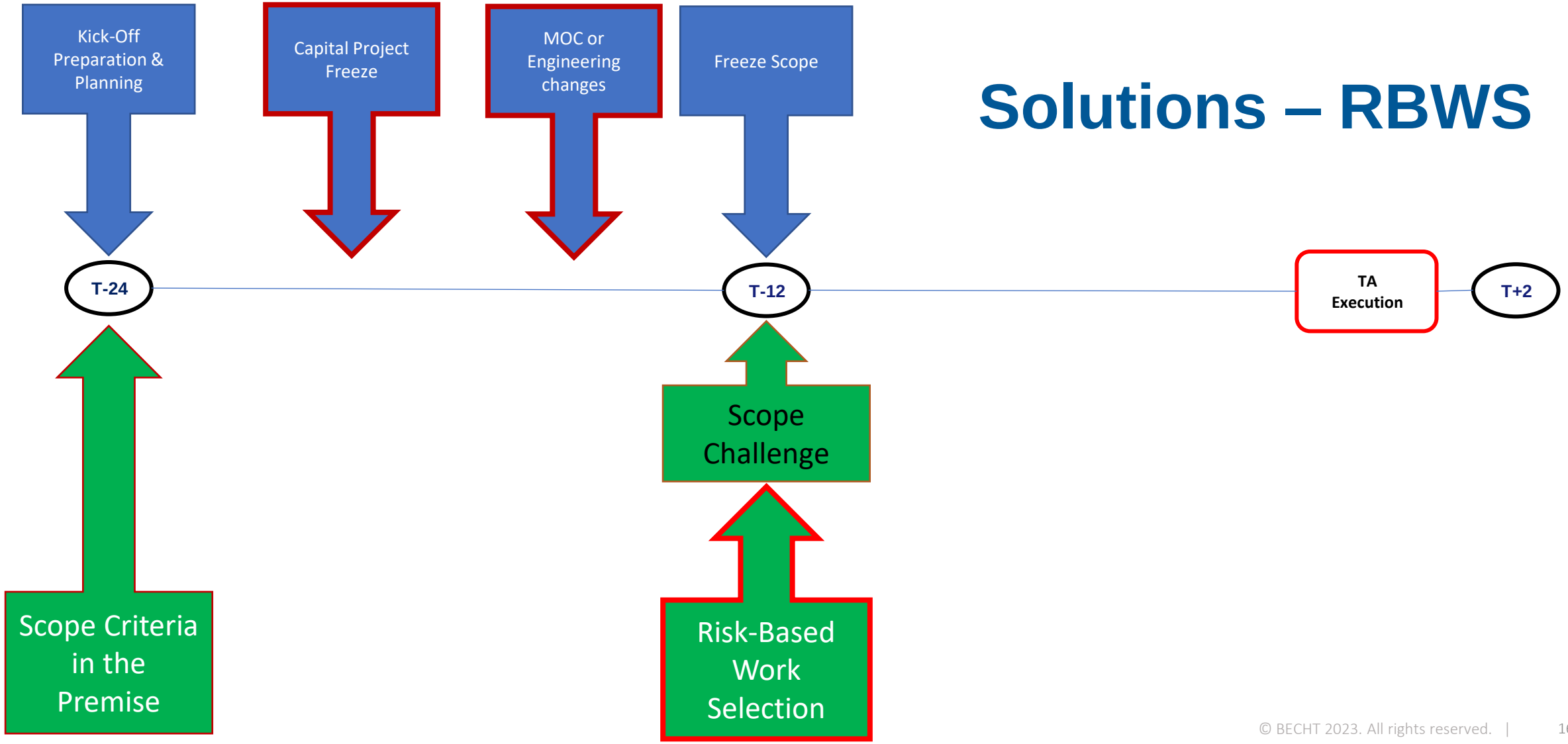
Typical Weaknesses With Scope Challenge and Ways To Fix Them



Solutions – RBWS

Typical Weaknesses With Scope Challenge and Ways To Fix Them

Scope Challenge With RBWS*

- The Scope Challenge can challenge all of scope items (including project scope) against:
  - Event Specific Scope Selection Criteria
    - i.e. Criteria to assess whether the scope item advances the business objective of the Event
  - Site Specific Scope Selection Criteria
    - i.e. Criteria to assess whether the scope item needs to be done in the Event window, or could be done in routine maintenance, or achieved with a smaller, simpler scope
  - BechtRBWS Tool
    - i.e. Whether the benefit of doing preventive scope in the turnaround outweighs the risk of possible failure during the next production run.

- *For more on this topic, see some of the following links:*
- *Blog Post by Abby King, Reliability Division Head at Becht: https://becht.com/becht-blog/entry/planning-a-turnaround-that-fits-using-rbws/*
- *Becht Website – RBWS software: https://becht.com/software-tools/rbws/*
- *Becht Website – RBWS Implementation: https://becht.com/becht-blog/entry/projects/rbws-program-implementation/*

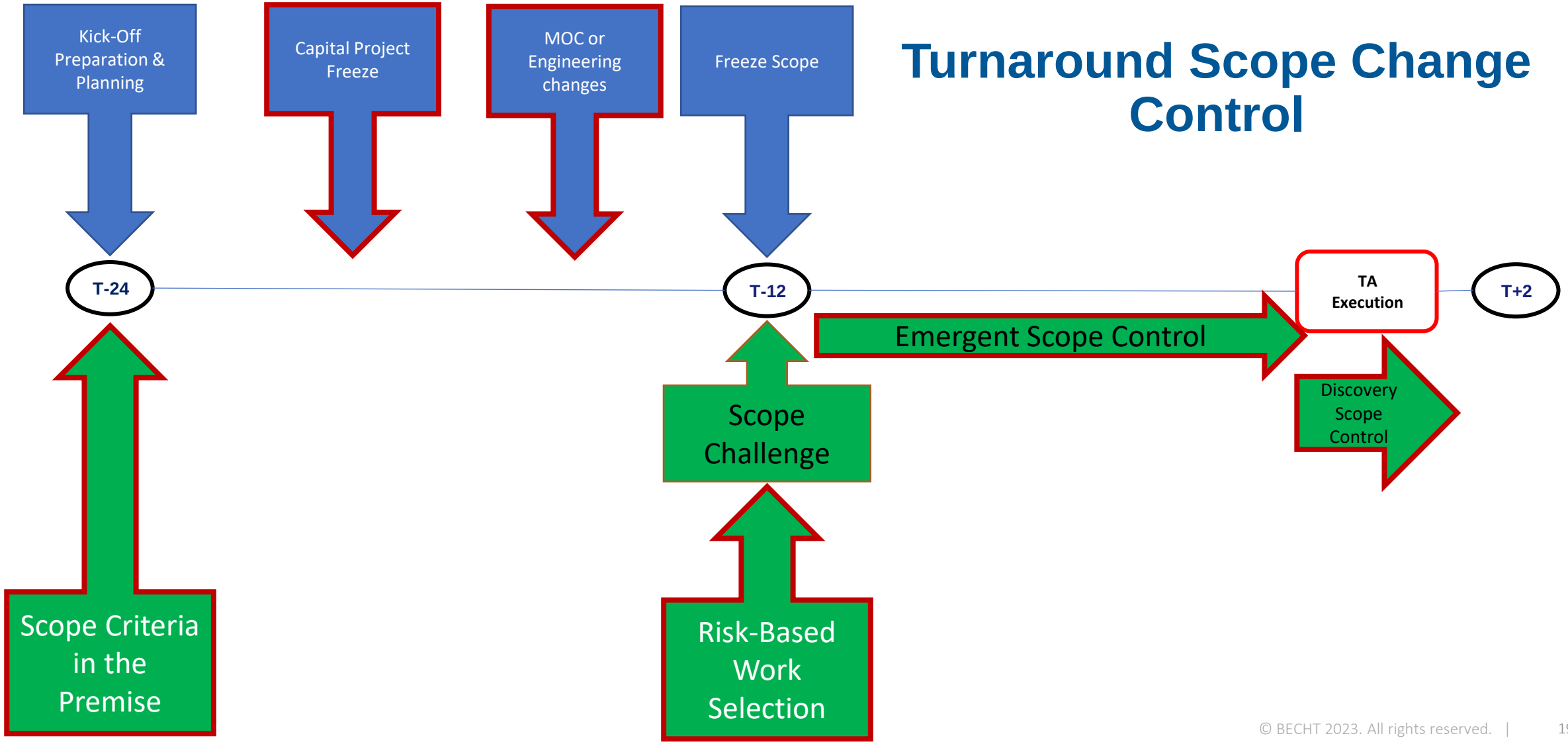
Reason We Care About Scope Control

Question 3:

What precent (of total budget) of additional scope is added to your worklist between the scope closure date and start of the turnaround?

a) 1 - 3%
b) 3 - 5%
c) 5 – 7%
d) > 7%

Typical Weaknesses With Scope Change Control and Ways To Fix Them



Typical Weaknesses With Scope Change Control and Ways To Fix Them

Common Problems With Scope Change Control

- Not all Known Scope was Gathered Before the Scope Challenge.
- It’s too easy to gain approval in the Scope Change Control Process.
- Additions not funded
  - Eats away at your discovery contingency
- Items excluded from the worklist earlier sneak back in through added work process.

Typical Weaknesses With Scope Challenge and Ways To Fix Them

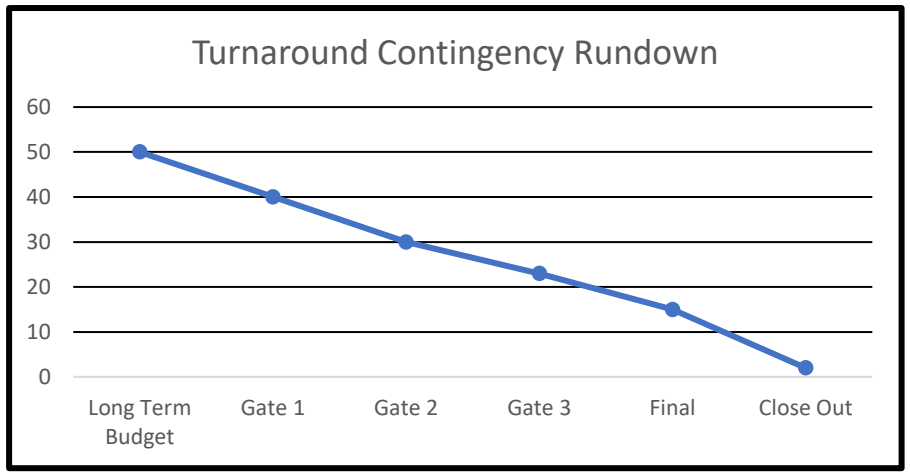
Estimating and Contingency Run Down

- Estimate Stages

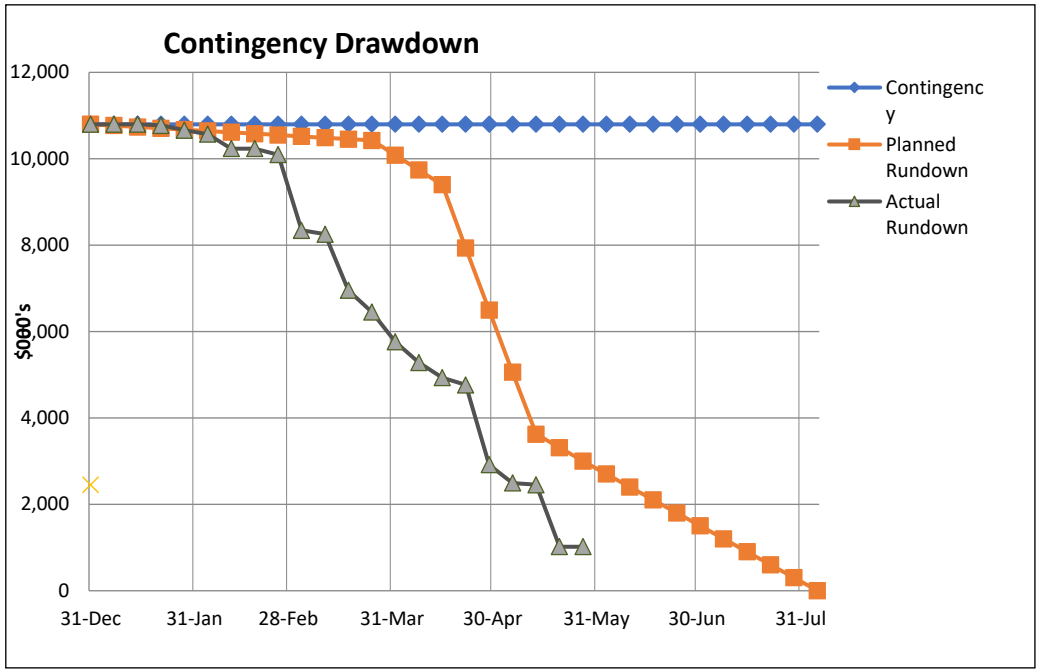
	Accuracy	Growth	Discovery	Total
Long Term Budget	25	17	8	50
Gate 1	20	12	8	40
Gate 2	15	7	8	30
Gate 3	10	5	8	23
Final	7	0	8	15
Close Out	2	0	0	2

Worklist Closure

- **Worklist Revision Process start**



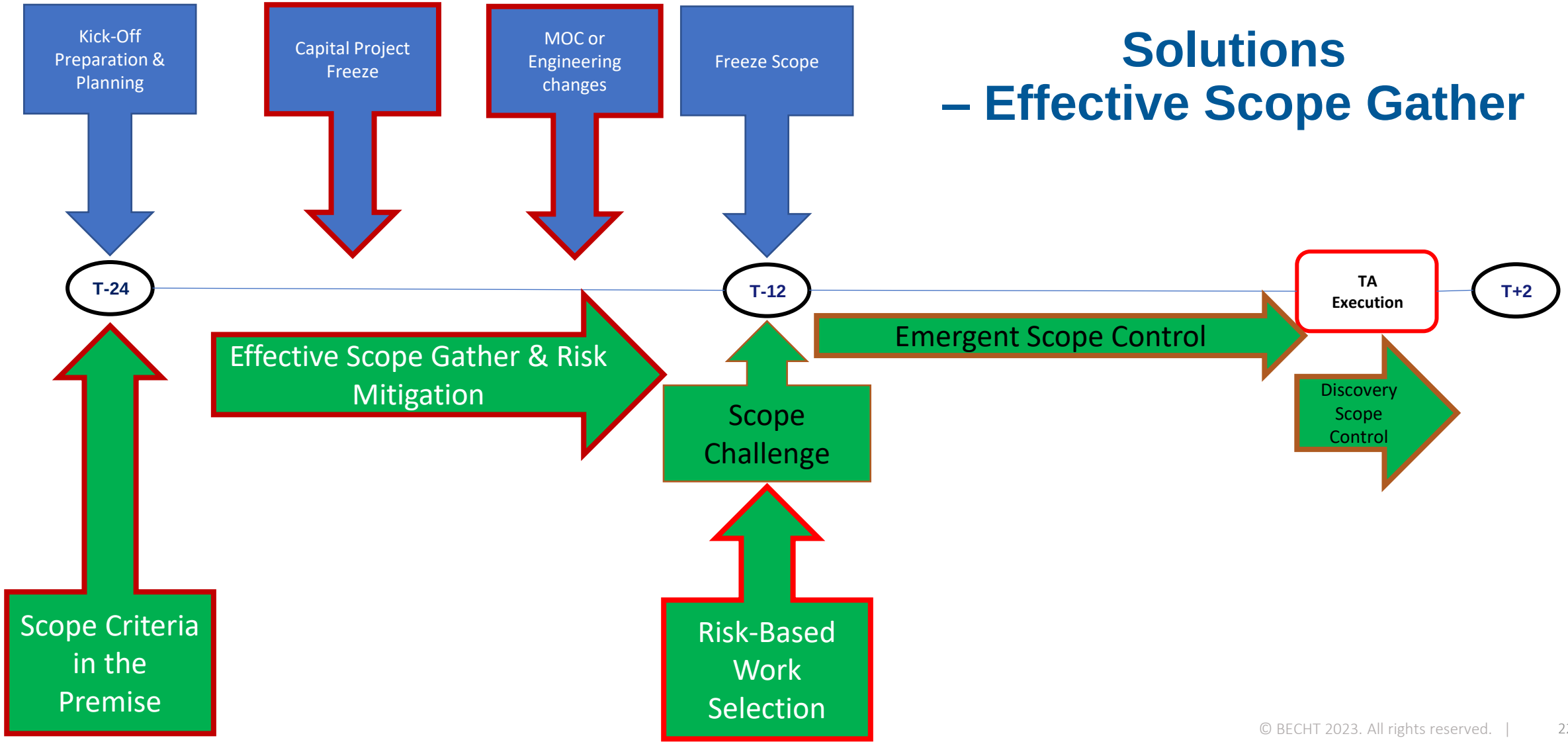
- During Turnaround



- Note: Emerging Scope(post closure to T/A) targets
  - < 5% total (scope additions & removal)

** For more on this, see this article by Becht consultant, Gordon Lawrence: https://becht.com/becht-blog/entry/turnaround-scope-optimization/*

Typical Weaknesses With Scope Change Control and Ways To Fix Them

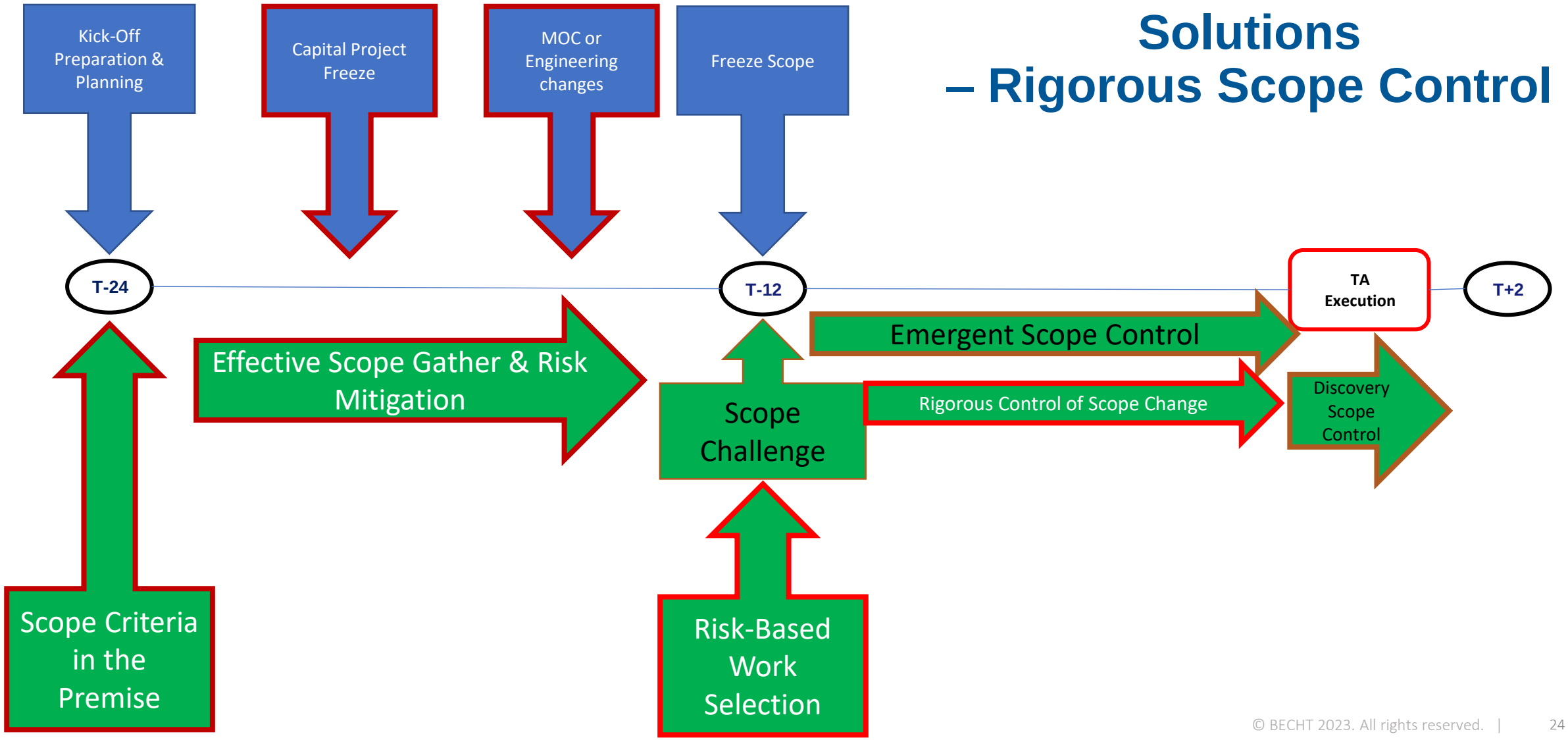


Solutions – Effective Scope Gather

Effective Scope Gathering

- Number of Best Practices that sites can adopt to ensure that the scope gathering process is effective.
  - Clear messaging from the Turnaround team about scope inclusion criteria, and about deadlines for submitting scope, and about hurdles for late scope.
  - Clear requirements for a minimum level of detail to be provided in the worklist.
  - Site-Wide Messages from senior leadership, to remind departments to submit their scope.
  - Early and thorough review of Maintenance Lists (e.g. SAP) to ensure that logged requests are tagged as needing a turnaround.
  - Monitoring of each department, to ensure that there are no laggards in submitting scope.
  - Conducting/evaluating a Risk Registers for the turnaround and its scope.
  - Identifying scope duplication, alignment, synergies, optimizations of total scope (Projects, Maintenance).
  - Clear funding and hurdle rates defined.

Typical Weaknesses With Scope Change Control and Ways To Fix Them



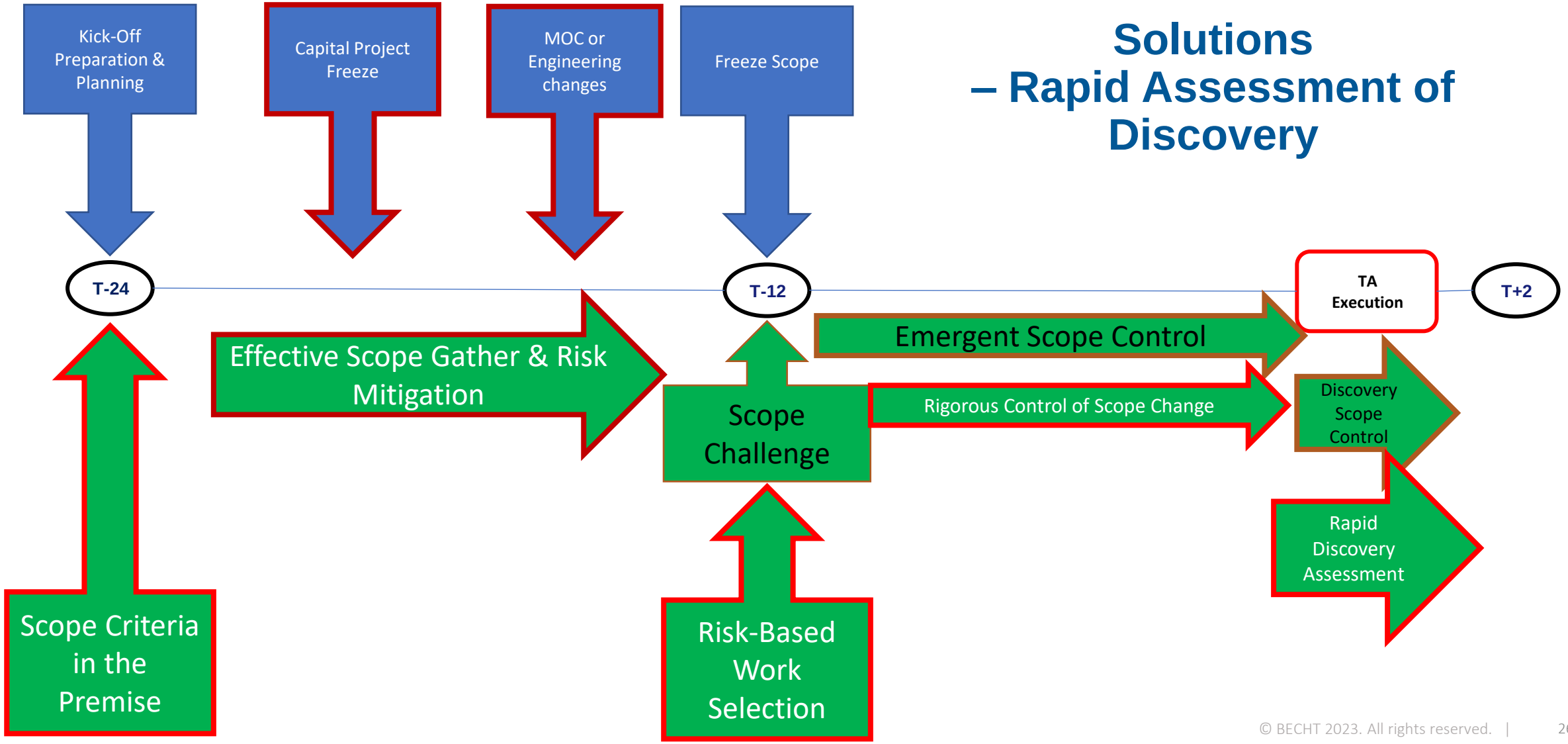
Solutions – Rigorous Scope Control

Typical Weaknesses With Scope Change Control and Ways To Fix Them

Rigorous Control of Scope Change

- There are a number of actions that can be taken to ensure that the Scope Change Control process works effectively.
  - These include:
    - Requiring the requestor to justify how this scope item meets the scope inclusion criteria.
    - Having a gradually increasing hurdle rate for request approvals, such that as the turnaround approaches, the requestor must approach more and more senior staff to have the request approved.
    - Make the tough decision early (per milestones)
    - Forgo late opportunities
    - Budget for addition scope growth between worklist closure and start of the turnaround.

Typical Weaknesses With Scope Change Control and Ways To Fix Them



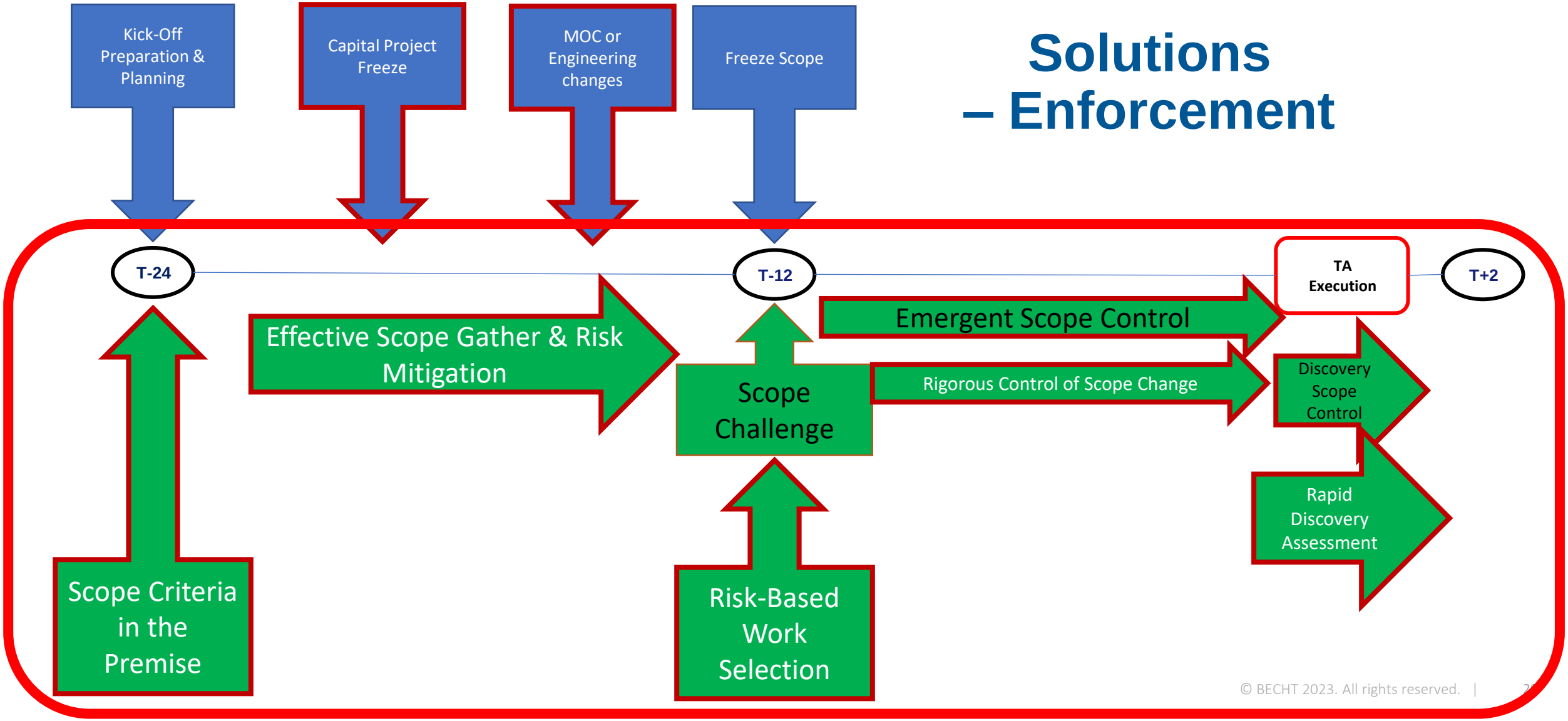
Solutions – Rapid Assessment of Discovery

Typical Weaknesses With Scope Change Control and Ways To Fix Them

Rapid Assessment of Discovery Scope

- There are several common issues with the way that Discovery scope is addressed.
  - One key issue, relates to how the scope is approved.
    - Timely decision making, the scope request often goes through a foreshortened Scope Change Control procedure.
    - Turnaround Manager is pressured to approve scope in a hurry.
    - Easy loophole for operations to push through preferred scope that was previously challenged out.
- But the same techniques that were used for the Scope Challenge can be used for Discovery Scope Requests.
  - This helps ensure that scope is not allowed through that has already been challenged out, and ensures that only scope which meets the scope inclusion criteria is included.
- Assess if it could have been predicted and contingency plans in place for quick action
  - Risk Registers, what-if exercises, pre-order, pre-design, pre-engineer (go/no go calculations)

Typical Weaknesses With Scope Change Control and Ways To Fix Them



Typical Weaknesses With Scope Change Control and Ways To Fix Them

Steering Team Role as Gatekeepers

- The Event Steering Team has a crucial role in “setting the tone” of how Scope Change Requests will be addressed and how easy it is to obtain approval of Scope Change Requests.
- Good practices include:
  - Steering Team members being fully aware of the reasons behind the need to:
    - Minimize scope
    - Avoid late scope
  - Steering Team members driving scope control, via scope request approvals.
  - Steering Team members accepting joint responsibility, with the Turnaround team, for scope change and its negative effect on cost and schedule predictability.
  - Department Heads answer for scope addition
    - Lessons learned

A Holistic Approach

- Scope growth is a common problem in turnaround organizations. Many teams turn to some form of “Risk-Based Scope Challenge” as the tool to remedy scope growth issues. But a “Risk-Based Scope Challenge” can be ineffective, if used in isolation.

- The Becht approach is holistic, addressing all aspects of scope growth, including:
  - Facilitating a workshop to set clear and prescriptive scope inclusion criteria in the Premise document.
  - Assessing the maximum reasonable Event size for the site organization, infrastructure and contractor resources to cope with.
  - Working with the Operations, Maintenance & Inspections representatives to ensure the “Scope Gathering” phase is effective.
  - Facilitating a thorough Risk Based Work Selection (RBWS) workshop, to challenge the scope, based on the scope inclusion criteria.
  - Working with the Turnaround team and Steering team to ensure that the Scope Change Request process uses best practice techniques to control and limit scope growth in both Emerging/Additional Work scope and Discovery scope.
  - Providing support to quickly and effectively process Discovery scope change requests during the execution window.
  - Providing support to the Event steering team, to guide them in best practice for controlling scope growth.

Thank you for your time and participation!

ANY QUESTIONS?

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