Examples of Rational Process Use During Project Implementation

Everything goes according to plan until work package 5.1 Robot Sites Visited. One of the site visits was unexpectedly postponed at the request of the host site, so the duration of the work package increased from 3 to 4 days. The last-minute nature of the change prevented the project team from making arrangements to start work package 5.2 Robot moved and installed on March 22). But other concerns crop up on March 22…

Project Environment on March 22

- The plant manager learns that one of the two long-term clients has asked for a temporary production stoppage.
- The engineering manager says work package 5.1 will be completed by the end of the day (a day late). This will affect the start of work package 5.2 (originally scheduled to start on March 22).
- Engineer informs engineering manager and project manger that a small, but key component of the robot is missing. This could delay the completion of work package 5.2 (originally scheduled to start on March 24).
- Maintenance manager finds out that the portable crane they were renting has failed inspection. This will affect the start of work package 5.2 (originally scheduled to start on March 22; now tentatively scheduled to start March 23).
- Order entry has placed a medium-sized but high-price-point order for materials that can only be produced on Line A.

The project manager questions those with primary responsibility for the work packages threatened by the various changes in the project environment. He uses Situation Appraisal to scan the environment and determine what action to take and whom to involve in resolving the issues.

The following project documents were created as a result of this scan:

Situation Appraisal

Managing Involvement

Decision Analysis

Potential Problem Analysis

The highest priority issue is delivering the new order, which is not within the scope of the project but has an impact on it. The project manager consults the entire project team (C2 leader behavior) to analyze the following binary decision: Continue the project as scheduled or delay the project to complete the new order? This binary decision statement is then raised: What's the best way to handle the Robot Installation project and the new order? The project manager also elects not to use any MUST objectives to make this decision.

Both these actions give the project manager several alternatives from which to make a choice. The project manager then presents his recommendation to senior management who decide to continue with the project at a more relaxed pace while diverting some of the project resources to producing the new order.

Once the decision is made, the project manager treats the two adverse consequences, identified during the decision analysis as potential problems. He takes appropriate preventive action and prepares the most cost-effective contingent actions to ensure the decision to complete the new order and continue with the project is implemented successfully.

The next highest priority issue is to find a crane rental vendor. For this routine decision, the project manager instructs Procurement to use their standard objectives for renting such equipment, but to make sure that: safety is a MUST, availability on the desired date is a MUST, and standard pricing is a highly weighted WANT.

At the end of the week, the project team reviews the status of concerns identified during the March 22 Situation Appraisal and scans the project environment for new threats and opportunities.

For example…

Situation Appraisal

22 March Situation Appraisal documented as a result of project environment scan.

Situation Appraisal

Identify Concerns | **Set Priority**

List threats and opportunities

What deviations are occurring?
What decisions need to be made?
What plans should be implemented?
What changes are anticipated?
What opportunities exist?
What bothers us about…?

Separate and clarify concerns

What do we mean by…?
What exactly is…?
What else concerns us about…?
What evidence do we have…?
What different deviations, decisions, or plans are part of this concern?

Consider current impact, future impact and time frame

What is the current impact on people, safety, etc.?
Which concern is most serious?
What will be the future impact?
Which concern is getting worse quicker?
What is the deadline?
When do we need to start?
Which concern will be hardest to resolve later?

Concerns	Concerns	Current Impact	Future Impact	Time Frame	Highest Priority
Changes in production schedule for Line A	One of the 2 long-term clients has asked to delay production to May 1 (these 2 clients' orders are one reason for undertaking the project)	Need for more production capacity decreases and project resources could be used elsewhere M	The need for more production capacity will return once long-term client's production starts back up L	More production capacity will be required by mid-April L	☐
	New mid-sized order with high price point can only be produced on Line A	Line A is unavailable due to robot installation H	We will loose the revenue and possibly the client if we cannot meet their delivery date H	Order delivery date March 28 H	☑
Work package 5.1 will be completed by the end of the day (1 day later than scheduled)	How to bring the project back on schedule?	Work package 5.2 Robot Moved & Installed cannot start today (March 22) M	All successor work packages will be delayed M	Every day behind schedule the project costs could increase M	☐
Key robot component missing	How quickly can we find a replacement?	We need to find a replacement starting today (March 22) M	All successor work packages will be delayed M	One day to resolve H	☐
Vendor called to say portable crane failed inspection--not available until next week	How quickly can we rent another portable crane?	Cannot move robot from secure area to Line A today (March 22) M	Robot installation will be delayed H	One day to resolve H	☑

Name: Production Manager **Date:** 22 March

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For example…

Situation Appraisal (continued)

Situation Appraisal

Plan Next Steps

Determine analysis needed

Do we need further clarification?
Do we have a deviation? Is cause unknown?
Do we need to know the cause of a deviation?
Do we need to make a choice?
Do we have an action or plan to protect (enhance)?
What do we need to do about the concern?
What additional analysis is needed?

Plan Involvement

Determine help needed

What needs to be done and when?
Who needs to be involved for…
- *Information?*
- *Analysis?*
- *Creativity?*
- *Commitment?*
- *Approval?*
- *Implementation?*
- *Development?*

Who will document our process and results?

Highest Priority	Process SA, PA, DA, PPA/POA	Action Needed	Who Does What and When
☐	DA	Should we continue the project as scheduled or relax the schedule and reassign resources to other projects?	Project manager to decide with plant manager based on production schedules (March 23)
☑	DA	Continue the project as scheduled or delay the project to deliver the new order?	Project manager to involve the rest of the project team to determine if the project should continue as scheduled or if it should be postponed until the new order is delivered (March 22); project manager to make an appointment to present the recommendation to senior management (March 23)
☐	DA	What's the best way to bring the project back on schedule?	Engineering manager, maintenance manager, and project manager to decide. Time frame depends on the decision to continue the project as scheduled
☐	PPA	What will further prevent us from completing the project on schedule?	Engineering manager and project manager to review what could go wrong with the plan. Time frame depends on the decision to continue the project as scheduled
☐	DA	Choose best way to get a replacement	Receiving clerk to check Bill of Materials to verify component was included and check secure area for missing component (March 22) Receiving clerk to work with vendor to get a replacement within one day (March 22)
☐	SA	Understand why the issue was not detected earlier	Plant manager to review the performance specifications for receiving materials and checking Bills of Material. This issue is not part of the project and will be reviewed at a later date
☑	DA	Find a crane rental vendor	Maintenance Manager to work with Procurement to find a new crane rental vendor; Procurement to check that crane has passed inspections (March 22); Maintenance Manager to inform Receiving clerk of when to expect the arrival of the new crane (March 22) and determine a time to move the robot (March 23)

Identify Concerns

List threats and opportunities

What deviations are occurring?
What decisions need to be made?
What plans should be implemented?
What changes are anticipated?
What opportunities exist?
What bothers us about…?

Separate and clarify concerns

What do we mean by…?
What exactly is…?
What else concerns us about…?
What evidence do we have…?
What different deviations, decisions, or plans are part of this concern?

Set Priority

Consider current impact, future impact, and time frame

Which concern should we work on first?
What is the current impact on people, safety, cost, productivity, customers, reputation, etc.?
Which concern is most serious?
If left unresolved, how and when will the seriousness change? What evidence do you have?
Which concern is getting worse quicker?
What is the deadline? When do we need to start?
When would resolution become difficult, expensive, or impossible? What evidence do you have?
Which concern will be hardest to resolve later?

Plan Next Steps

Determine analysis needed

Do we need further clarification?
Do we have a deviation? Is cause unknown?
Do we need to know the cause of a deviation to take effective action?
Do we need to make a choice?
Do we have an action or plan to protect (enhance)?
How much of the process is needed?

Plan Involvement

Determine help needed

What needs to be done and when?
Who needs to be involved for…
Information? Approval?
Analysis? Implementation?
Creativity? Development?
Commitment?
Who will document our process and results?

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For example…

Managing Involvement

22 March Managing Involvement documentation.

Involvement Process

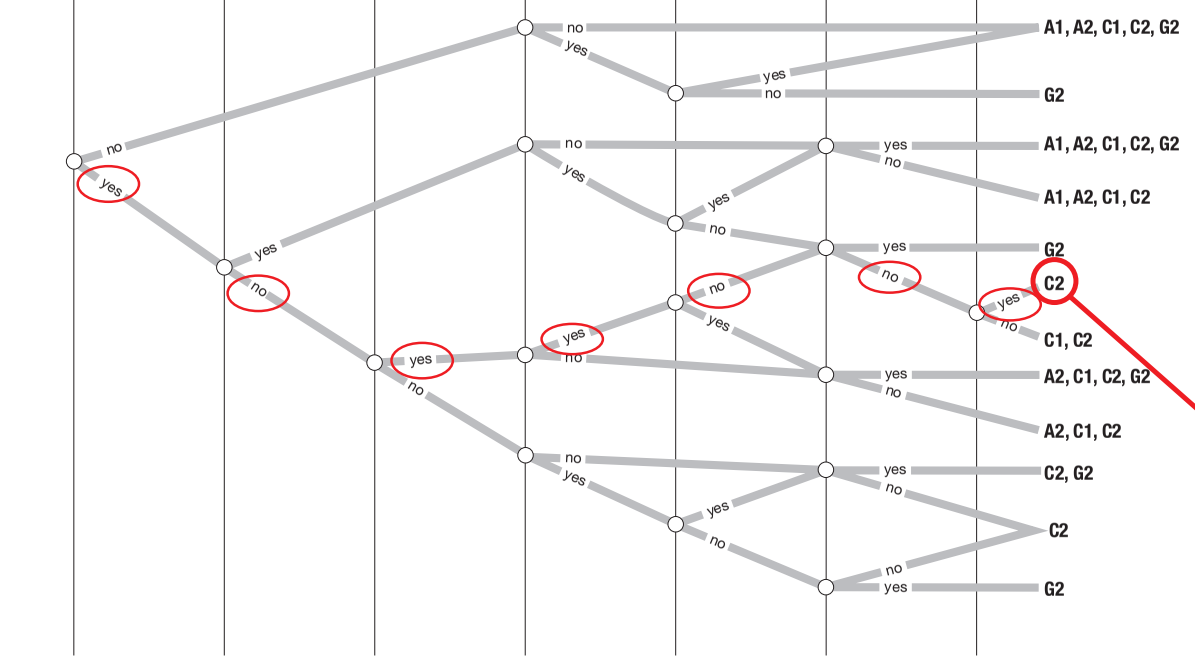
1 Define the Situation:

The Robot Installation project is currently a day behind schedule. The project can still be completed on time if more resources are assigned to work package 5.2 Robot Moved and Installed. However, other concerns have cropped up, one of which is the temporary suspension of production of one of the two large orders for which this project is being undertaken. The other concern is that of a new order which has a high price point but can only be produced on Line A. The project manager is confronted with a decision: Continue the project as scheduled and incur a cost overrun or postpone it until the new order that will generate more revenue and that can only be produced on Line A is completed. The project manager wants to ensure that he involves the right people in the decision and adopts the right leader behavior. He is aware that the project team would like to complete the project and that the organization might not want to lose a revenue-generating opportunity.

2 Assess the Variables:

Solution	Information	Structure	Commitment	Participation	Agreement	Alternatives
Does it make a big difference which course of action is adopted?	Do you now have enough information to find a superior solution?	Do you know exactly what information is missing and how to get it?	Is commitment of others critical to effective implementation?	Will they commit to a conclusion made by you without their active participation?	Is there general agreement about goals between the group and the organization in this situation?	Is there likely to be conflict about alternatives within the group?
yes ☑ no ☐	yes ☐ no ☑	yes ☑ no ☐	yes ☑ no ☐	yes ☐ no ☑	yes ☐ no ☑	yes ☑ no ☐

3 Select the Behaviors:
Identify effective behaviors



Make final choice:

- A1 — Resolve Alone ☐
- A2 — Question Individuals ☐
- C1 — Consult Individuals ☐
- C2 — Consult Group ☑
- G2 — Resolve as Group ☐

For example…

Decision Analysis

22 March Decision Analysis which indicates "Continue the project and deliver new order" as the best balanced choice..

Decision Analysis

Clarify Purpose

State the decision *What is the purpose of this decision? What is the appropriate decision level? Include a choice word, a result, and 1 or 2 key modifiers.*

Binary: Continue the project OR Delay the project?
Raised: What's the best way to handle the project and the new order?

Develop objectives
What results do we want?
What resources should we use or save?
What restrictions do we have?
What objectives need to be more specific?

Classify objectives
If the objective is mandatory, measurable, and realistic, label it a MUST Ⓜ.

Weigh the WANTs
For the other objectives, what is the relative importance of each WANT?

Evaluate Alternatives

Generate alternatives
What choices do we have?

Screen through MUSTs/Compare against WANTs
How does this alternative satisfy this objective?
Performance: MUST — Eliminate any alternatives that do not meet all MUST objectives. (Label them No Go.)
WANT — Rate the performance of each alternative against the WANT objectives.
Record information on performance.

Objectives	Measures		Alternative 1: Continue as Planned and Not Deliver New Order			Alternative 2: Put the Project On-hold and Deliver New Order			Alternative 3: Continue the Project and Deliver New Order			Alternative 4: Continue as Planned and Produce New Order at Another Location		
			Performance	Score		Performance	Score		Performance	Score		Performance	Score	
Complete the project within original budget	$9,500	7	6	42	Possible cost overrun to complete 5.2 on time ($1,600)	8	56	May go slightly over the estimate (lost momentum)	10	70	Should be able to complete as estimated	6	42	Possible cost overrun to complete 5.2 on time ($1,600)
Complete the project as originally scheduled	31-Mar	6	10	60	Likely delay of 1 day because of missing robot part, and no available crane to move the robot	0	0	Will not meet this objective	5	30	Wait 2-3 days for missing robot part, crane availability, and to complete new order	10	60	Likely delay of 1 day because of missing robot part, and no available crane to move the robot
Meet the project's performance objectives	Meet defined standards	10	10	100	Should be able to meet the performance objectives as defined	10	100	Should be able to meet the performance objectives as defined	10	100	Should be able to meet the performance objectives as defined	10	100	Should be able to meet the performance objectives as defined
Deliver the new order on time	28-Mar; usual start-up costs	8	0	0	Cannot meet timeframe if Line A continues to be down until March 31	10	80	Should be able to deliver the new order on time	7	56	May take slightly longer to complete than is usual because of the robot project	5	40	Should be able to deliver the new order on time, but start up costs are higher
Deliver the new order to customer's expectations	Meet agreed quality standards	10	0	0	Order can be produced only on Line A	10	100	Should be able to meet this objective	10	100	Should be able to meet this objective	10	100	Should be able to meet this objective
Utilize existing people	No additional resources hired	4	5	20	To complete the project as planned, 2 additional electricians and maintenance personnel are needed for 2 days	10	20	Will be able to meet this objective	7	28	May need additional resources to do both projects	10	40	Will be able to meet this objective
Observe all safety regulations	As defined by regulatory agencies	10	10	100	Safety procedures incorporated into project plan	5	50	Line A currently known to have high accident rate	5	50	Line A currently known to have high accident rate	6	60	Line at new location has a better safety record
				322			406			434			442	

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Name: Production Manager **Date:** 22 March

For example…

22 March Decision Analysis (continued)

Assess Risks

Identify adverse consequences

What are the implications of being close to a Must limit?
Where might information about this alternative be invalid? What are the implications?
What could go wrong, short and long term, if this alternative were chosen?

Assess the threat

How likely is each adverse consequence? (probability)
What impact will this adverse consequence have? (seriousness)

Highest performing alternative

Continue the Project and Deliver New Order

		Probability	Seriousness
If	we continue to have delays with the project	L	
then	we may not be ready to start production of the two large orders		M
If	we are not able to lower our accident rate on Line A	M	
then	regulatory agencies may impose stiff penalties on us		H
If			
then			
If			
then			

Second highest performing alternative

Continue as Planned and Produce New Order at Another Location

		Probability	Seriousness
If	the new location has many orders to deliver at the same time	H	
then	overtime resources will eat into the profitability of the order		M
If	the new location is at a distance from the client	M	
then	delivering the finished product could cause logistical problems		H
If			
then			
If			
then			

Make Decision

Make the best balanced choice
Examine the risks and benefits. Mark your best choice.

☑ ☐

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Decision Analysis

Clarify Purpose

State the decision
What do we need to decide?
What are we trying to do?

Develop objectives
What short- and long-term results do we want?
What resources should we use or save?
What restrictions influence this choice?
How does…
Management, Policy, Human Resources, Law and Regulation, Competition, Cost, Research, Time, Equipment, Facilities, Productivity
…influence this choice?
Which objectives need to be clarified by making them more specific?

Classify objectives into MUSTs and WANTs
Is this objective mandatory?
Is this objective measurable? } *Yes to all 3 = MUST*
Is this objective realistic?
All other objectives are WANTs.
Which MUST objectives should be reflected in the WANTS?

Weigh the WANTs
What is the relative importance of each WANT?

Evaluate Alternatives

Generate alternatives
What are the different choices available?

Screen alternatives through the MUSTs
Does this alternative meet each MUST limit?

Compare alternatives against the WANTs
How do the alternatives perform against each WANT objective?

Assess Risks

Identify adverse consequences
What are the implications of being close to a MUST limit?
Where might information about this alternative be invalid?
What are the implications?
What could go wrong, short and long term, if this alternative were chosen?

Make Decision

Make the best balanced choice
Are we willing to accept the risk(s) to gain the benefit of this choice?

For example…

Potential Problem Analysis

22 March Potential Problem Analysis conducted on the adverse consequences identified in the decision to "continue the project and deliver the new order."

Potential *Problem* Analysis

Identify Potential Problems | **Assess Threats**

State the action *What is the end result to be achieved? What actions need to be taken to reach the end result? Which actions are critical?.*

Continue robot installation and deliver new order

List potential problems
When we do this, what could go wrong? What problems could this action cause?

Identify likely causes
What could cause the potential problem? What else could cause…?

Set priority
Label with check √ or number

Identify likely effects
What short- or long-term effects would this potential problem have if it were to happen? What other effects…?

Assess probability
How likely is this potential problem? What data do you have? How probable? H/M/L

Assess seriousness
How damaging will each effect be? What data do you have? How serious? H/M/L

Potential Problems	Likely Causes	Probability (%)			Seriousness ($)	Likely Effects
Injuries on Line A increase	1. Operators distracted by having to work on two projects 2. Robot is in the operators' way	Has happened with previous rush orders; now we have the robot as added distraction (35%)	M	1	H	Late orders and unsafe conditions will damage our reputation with our clients ($$$) Regulatory agencies impose penalties Both the new order and the robot project could be delayed
Other new orders for Line A are accepted	1. Reluctance to pass up on new revenue-generating opportunities 2. Order Entry not aware of the Robot Installation project or its status	Most orders can be completed on the other 2 lines (5%)	L	2	M	No profit likely and some damage to the relationship with the 2 clients ($$) Late delivery of the two large orders (production for one is to begin April 1, and the other has been delayed to May 1)

Name: Production Manager **Date:** 22 March

For example…

Potential Problem Analysis (continued)

Prevent Likely Causes | **Minimize Likely Effects**

Potential *Problem* Analysis

Take preventive actions

What can we do to prevent this likely cause from happening?
What can we do to reduce the chances of this likely cause happening?
How can we keep this likely cause from creating the potential problem?

Plan contingent actions

What will we do if this potential problem happens?
What will minimize the effects if this potential problem happens?
What can we do to recover quickly, cheaply, and effectively?

Set triggers for contingent actions

How will we know the potential problem has occurred?
What will activate each contingent action?
When will it start and end?

Preventive Actions	Contingent Actions	Triggers
1. Assign most experienced operators to work on completing the new order; have other functions/trades focus on the robot	Divert operators from other lines to Line A	Operators begin to report injuries to the Supervisor. Supervisor keeps Production Manager informed. Remove this contingent action when the order is complete (28 March)
2. Do not move the robot from the secure area until the order is close to completion	Upgrade the robot installation to top priority (being undertaken to reduce injuries) and inform regulatory agencies and clients	
1&2. Communicate timeframe of robot installation project and expected benefits to Sales and Order Entry and provide frequent status reports	Farm the new orders to other locations	Order Entry informs Production Manager directly of new orders. Remove this contingent action work package after 6.2 is completed (4 April)
	Keep Sales and the two customers informed of progress and provide concessions on work that is already deeply discounted	

Identify Potential Problems

State the action
What is the end result to be achieved?
What actions need to be taken to reach the end result?
Which actions are critical?

List potential problems
When we do this, what could go wrong?
What problems could this action cause?

Assess Threats

Identify likely causes
What could cause the potential problem? What else could cause…?
How likely is this potential problem? What data do we have?

Identify likely effects
What short- or long-term effects would this potential problem have if \it were to happen? What other effects…?
How damaging will each effect be? What data do we have?

Prevent Likely Causes

Take preventive actions
What can we do to prevent this likely cause from happening?
What can we do to reduce the chances of this likely cause happening?
How can we keep this likely cause from creating the potential problem?

Minimize Likely Effects

Plan contingent actions
What will we do if this potential problem happens?
What will minimize the effects if this potential problem happens?
What can we do to recover quickly, cheaply, and effectively?

Set triggers for contingent actions
How will we know the potential problem has occurred?
What will activate each contingent action?
When will it start and end?

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