




| Risk Item | Cause | Effect | Probability | Severity | Overall Risk | Action to Minimize Risk | Owner |
|--|---|---|-------------|----------|--------------|--|-----------------------------|
| Transition plan not completed by the end of MSD II | Not enough time left in time frame of MSD II to work on a completed transition plan Not enough information provided by customer to understand procedures | Longer transition from current state to future state Increase in conversion costs Disrupt Gasket cell operations and production | 2 | 3 | 6 | Give this task priority over less important action items on the project schedule Break down transition plan to small manageable levels and provide customer with hand-off procedures in case plan does not get completed by end of MSD II | Cody Willmart |
| Workers not accepting new system | Workers like the "old way" more than the new Unanticipated worries from workers of job security with implementation of new system | Workers resort back to tribal knowledge Loss of confidence in future process innovation projects | 3 | 2 | 6 | Treat workers as customers and value their inputs Keep workers updated with project progress and inform them early of what to expect | Daniel Swol |
| Solution does not improve flow | Poor flow analysis of current and future state systems Unanticipated conditions that prohibit flow | Increase in operational costs Longer lead times of product delivery Added waste to D-R's operation | 2 | 3 | 6 | Develop and continuously review flow diagrams and value stream maps | Jacky Li |
| Process change has negative effects on other processes | New process disrupts the operation of other processes Poor flow analysis Unanticipated side-effects from new change | Incurred downtime of other processes Disrupted operational flow of the plant Delays in production | 2 | 3 | 6 | Study the effects of the new system with other existing processes Integrate other processes into the new system through small steps Run a simulation of the new system | Tyler Borden |
| Customer Needs Change | Customer finds that certain needs are no longer suitable for project Customer adds needs due to upper management request | Creates project scope creep Disrupts flow of project and causes delays | 1 | 3 | 3 | Prior to the design phase have a meeting with customer to lock down on needs to prevent new additions later on | Aaron Marcotte |
| Solution has poor ergonomics | Team overlooked the OSHA worker safety requirements | Operator continues poor unsafe practices Increase of injury/near-miss incidents | 1 | 3 | 3 | Redesign cell to minimize unsafe practices Evaluate and remove unsafe procedures from current state | Jacky Li |
| Solution increases operational costs | High maintenance and service costs for equipment New system takes longer to produce product Poor analysis of current and future operational costs | Loss of D-R customers due to dissatisfaction Loss of marketshare in gasket manufacturing Increase in operational costs | 1 | 3 | 3 | Perform careful analysis of D-R's current and future state's cost of operation Review with customer the economical feasibility of the new system | Daniel Swol Tyler Borden |
| Team unable to complete project on time | Underestimated workload Poor time management | Unsatisfied Customer Damaged MSD relations with D-R | 1 | 3 | 3 | Inform advisor and customer with weekly progress of project Review gantt chart and complete required tasks | Cody Willmart |
| Solution does not meet customer needs | Poor project planning and misinterpretation of customer needs Lack of or over analyzing customer needs during the design process | Unsatisfied Customer Damaged MSD relations with D-R Proposal does not get implemented | 1 | 3 | 3 | Verify with customer on a weekly basis to see if needs are met | Cody Willmart |
| Entire team unable to travel to D-R | Poor weather conditions Prior commitments on campus | Unmet weekly deliverables Delay in project schedule | 1 | 3 | 3 | Work with available data on campus Keep in contact with D-R staff via phone or email | Cody Willmart |
| New technology causes increase in injury/near-miss incidents | Workers are unfamiliar with new technology New technology is very difficult to operate | Operator gets injured during operation Increase of injury/near-miss incidents | 1 | 3 | 3 | More training Apply visual aids, standard work, poka-yoke | Aaron Marcotte |
| Team member not available for trip to D-R | Prior commitments Unplanned accident/incident Appointments | Lack of data collection Less contribution/Idea generation Uneven workload | 2 | 1 | 2 | Assign work to absent member after visit Update absent member with latest project progress | Cody Willmart |
| Project scope is too big | Underestimate the scope of the project Try to include more than what is needed for the project | Project does not get completed on time | 1 | 2 | 2 | Use pareto analysis to narrow scope of the project to just a few important needs from the customer, if the needs are too much to handle | Cody Willmart |
| Conflict among team members | A difference in opinion Personal issues | Delay in project schedule Lack of communication Inefficient team performance | 1 | 2 | 2 | Address concerns openly with the team Consult project advisor if issue continues Listen to and respect opinions of other members | Cody Willmart |
| Not getting required info from equipment manufacturer | Lack of communication Uncooperative client-facing representative from manufacturer | Unable to perform proper research Lack of proposals to present to customer | 1 | 2 | 2 | Contact a wide range of equipment manufacturers Develop good relationships with manufacturers and maintain professionalism Work with Dresser-Rand to Contact Suppliers | Tyler Borden |
| Solution falls out of D-R's budget | Poor estimation of parts /labor /and equipment costs Capital acquisition costs are higher than expected | D-R does not implement proposal | 1 | 2 | 2 | Develop and continuously review flow diagrams and value stream maps | Jacky Li |
| D-R staff unavailable | Prior commitments Poor weather conditions Plant closure | Delay in project schedule Lack of data collection Misunderstand customer needs | 1 | 2 | 2 | Continue work with available data on campus Keep communication with D-R staff via phone/email | Cody Willmart |
| D-R staff leaves position/organization | Personal reasons Another job/position offer | Delays in project schedule New D-R staff might not be as enthusiastic about the project | 1 | 2 | 2 | Keep good relationship and communication with our current customer | Cody Willmart |

| Probability Scale | Severity Scale | Overall Risk Scale |
|--|---|--------------------|
| 1- This cause is unlikely to happen | 1- Impact on the project is very minor. Still meet deliverables, but will require extra work. | 1-3: Low Risk |
| 2- This cause could conceivably happen | 2- Impact on the project is noticeable. Deliver reduced functionality and fail to meet some of our engineering specifications | 4-6: Medium Risk |
| 3- This cause is very likely to happen | 3- Impact on the project is severe. Not able to deliver, or what we deliver will not meet the customer's needs. | 7-9: High Risk |

| Color Code |
|---|
|  Low Risk/ Low Probability/ Low Severity (Accept) |
|  Medium Risk/ Medium Probability/ Medium Severity (Reduce) |
|  High Risk/ High Probability/ High Severity (Prevent) |