

Improvement in the incident reporting and investigation procedures using process excellence (DMAI²C) methodology

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Available online 12 October 2005

Abstract

In 1996, Health & Safety introduced an incident investigation process called *Learning to Look*[®] to Johnson & Johnson.¹ This process provides a systematic way of analyzing work-related injuries and illness, uncovers root cause that leads to system defects, and points to viable solutions. The process analyzed involves three steps: investigation and reporting of the incident, determination of root cause, and development and implementation of a corrective action plan.

The process requires the investigators to provide an initial communication for work-related serious injuries and illness as well as lost workday cases to Corporate Headquarters within 72 h of the incident with a full investigative report to follow within 10 days. A full investigation requires a written report, a cause–result logic diagram (CRLD), a corrective action plan (CAP) and a report of incident costs (SafeCost) all due to be filed electronically. It is incumbent on the principal investigator and his or her investigative teams to assemble the various parts of the investigation and to follow up with the relevant parties to ensure corrective actions are implemented, and a full report submitted to Corporate executives.

Initial review of the system revealed that the process was not working as designed. A number of reports were late, not signed by the business leaders, and in some instances, all cause were not identified. Process excellence was the process used to study the issue. The team used six sigma DMAI²C methodologies to identify and implement system improvements.² The project examined the breakdown of the critical aspects of the reporting and investigation process that lead to system errors. This report will discuss the study findings, recommended improvements, and methods used to monitor the new improved process.

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Keywords: Incident investigation; Process improvement

1. Phase 1: define

The define phase for this project consisted of: selecting a team whose members brought expertise to the study, a project charter to define our mission, a SIPOC diagram of suppliers, inputs, process parameters, outputs and customers to define our end process and goals, and a voice of the customer survey (VOC) to understand what is critical to quality (CTQ).

1.1. Problem statement

In 2001, there were 47 work-related injuries/illness classified by J&J as serious and 99 cases classified as lost workday cases reported worldwide.³ Although these numbers are low when compared to industry averages, the cost to the corporation was approximately US\$ 4,672,000.⁴ Close examination of the reported incidents revealed a frequency pattern for certain types of injuries that Johnson & Johnson found unacceptable. Could we have prevented many of these cases with better investigations, better communications, and/or more accountability for sharing

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¹ Learning to Look[®] is the Johnson & Johnson system for incident investigation.

² Greenbelt is a designation assigned to a group working on a problem using the DMAI²C methodology. DMAI²C refers to the methodology used to achieve six sigma (3.4 defects per million opportunities). It refers to the five stages of the process: define, measure, analyze, innovative improvement and control.

³ It is possible for the same case to be classified as a J&J serious as well as a lost workday case.

⁴ The cost of a lost workday case has been determined to be US\$ 32,000 per event. Report by DuPont and used by Organizational Resources Council (ORC) member companies.

of solutions and lessons learned? What defects in the system went unanswered that permitted our associates to be felled by the same injuries and illness year after year? What could we do to reduce the frequency of certain types of incidents? This was our challenge.

1.2. Team selection

The team was selected based on contributions that each member could bring to the process:

Team member	Job title	Expertise
Team leader	Worldwide Manager, Health & Safety and project leader	Architect of J&J incident investigation process
Executive sponsor	Worldwide Vice President of Health & Safety	Executive sponsor of the project
Member 1	Senior Process Design and Delivery Specialist	Data Analysis Specialist
Member 2	Director Safety Engineering Services	Machine Safety Specialist
Member 3	Sr. Occupational Safety Specialist	Safety Professional assigned to an operating company
Member 4	Professionally certified engineer ((PE) and former J&J third party auditor)	Architect of J&J incident investigation process

1.3. Project charter

As part of the business case for the project, we proposed that by improving the number of serious injury/illness cases (SIICs) and lost workday cases (LWDCs) by 10% and *producing complete and accurate investigations and reports*, we would have the following results:⁵

- Fewer associates with serious injury/illness or days away from work because of injury or illness.
- More productive workdays for affiliates.
 - Cost savings of US\$ 416,000 direct and indirect cost.
 - Corporate personnel spending fewer hours seeking additional information and reworking investigations and more time for other productive work.

1.4. SIPOC

We began to identify the critical parts of our current process by developing a SIPOC diagram.⁶ This allowed us to identify our suppliers, inputs, process, outputs, and customers. If we wanted to improve the process, we knew it was essential to understand all the parts of the process and how they fit together and to ensure that all team members and sponsors viewed the process in the same way.

1.5. SIPOC diagram

Suppliers	Inputs	Process to improve	Outputs	Customers
<ul style="list-style-type: none"> • Injured person • Co-workers • Observers • Medical personnel • S&IH • SME(s) • First aid • Management • Equip. vendors • Engineering 	<ul style="list-style-type: none"> • Demographics • Work history • Training info. • Incident Info. • Tools/Equip. • Immediate causes • Basic causes • System causes • Injury/illness Info. • Site history • Site processes • Follow up • Corrective actions 	<ul style="list-style-type: none"> • Injury/illness occurs • Send 72 h report • In-depth investigation • Develop logic diagram • Develop CAP • Implement CAP • Submit final report with supporting documents • Follow up 	<ul style="list-style-type: none"> • Complete and accurate 72 h report • Identification of root cause • Cause–result logic diagram • Corrective action plan • Implementation of appropriate solutions • Communication of the incident and its solutions 	<ul style="list-style-type: none"> • Employees • Managers • Operating companies • Health & Safety personnel • Executive management

⁵ Serious injury/illness case (SIICs) is a classification used by J&J to define incidents that result in death, amputation, or fracture (other than hairline) or inpatient hospitalization (other than for observation). Lost workday case (LWDCs) refers to a case where an associate cannot report to his or her next scheduled shift because of work-related injury or illness.

⁶ SIPOC diagram—high-level process map that defines suppliers, inputs, outputs, and customers in relationship to your process. It helps to ensure that everyone views the process the same way.

1.6. Voice of the customer⁷

Our next step was to construct a questionnaire that would permit us to hear the voice of the customer (VOC) to determine their understanding of the process and to determine whether it meets their needs and expectations.⁶ The questionnaire was sent to both internal and external customers.⁸ Our goal was to learn whether the problem lay in nonconformance with the established process and procedures, or in the process itself. We were also interested in the customers' input on what is critical to the process.

- Completed investigation submitted within 10 working days of the incident for cases required to be reported.
- Cause–result logic diagram submitted with all causes identified.
- Corrective action plan submitted with due dates and responsible parties with all aspects implemented by assigned due dates.
- Submission of the cost data within a reasonable time after the incident if applicable.

Voice of the customer	Identified issues	Critical to quality
Reporting issues	No accountability for timeliness of initial reports and or corrective action plans	Initial report received within 72 h of the incident Corrective action plan reported within a defined time
Investigators receive little or no feedback to help hone their skills	Poor analysis	Accountability for managers, executives, and technical experts in accepting their role in incident investigation
Investigators not comfortable with the J&J incident investigation process	Incorrect causes not challenged The LTL process is not a core competency for new supervisors and managers	Well trained investigators
Because of low frequency of serious injuries/illness, investigators are not skilled in developing cause–result logic diagrams	Investigators do not submit logic diagrams (fault tree diagrams) defining root cause	An intuitive, didactic and easy to use system that does not depend on the frequency of use
Incident solutions and best practices are not shared	There is not a sharing mechanism or database that facilitates the sharing of solutions and best practices	An electronic system is needed that facilitates the sharing of solutions and makes best practices available

2. Phase 2: measure

2.1. Data collection plan

Historical data was reviewed focusing on the following: defect data was collected from the 2001 reports and investigations; and timeliness and accuracy data was collected from 2001 to 2003 Y-T-D reports and investigations.⁹ The data was defined as discrete. One hundred and sixteen reports were reviewed using the operational definition below:

2.2. Operational definition

Complete and accurate Report

- 72 h Report submitted within 72 h of the incident.
- All areas of the report completed.
- All causes identified as defined in Learning to Look[®].
- Corrective actions associated with identified causes.

⁷ The team members designed the voice of the customer survey to determine how the process actually worked in our operating companies. It was sent to professionals that are assigned incident investigation for our operating companies. The audience includes both health and safety professionals and operating company personnel. The survey is based on 2003 data.

⁸ Internal customers are Health & Safety professionals assigned to operating companies that report to Corporate. External customers are Health & safety professionals and operations personnel that report to our operating companies.

⁹ The defect data for 2002–2003 was corrected as received and entered into a database in preparation for any new system that might be developed, therefore, defects data was not available.

Defect calculation

- The number of defects per opportunity.

2.3. Measurement parameters

2.3.1. System defects

- # incomplete 72 h reports submitted (not filled out correctly);
- # final reports submitted to Corporate that do not provide enough information to provide a full picture of the incident and rationale for the corrective action(s) selected;
- # final reports submitted without corrective action(s) for each identified cause;
- # final reports submitted with inappropriate corrective action(s);
- # reports submitted without a corrective action plan, responsible parties or due dates.

2.4. Measurement results

- There was an average of 3.7 errors per report reviewed.¹⁰
- Little documentation was found indicating accountability for review of corrective action plans by site management or Corporate management.

¹⁰ See defects Chart 1 in the Time Series Plot.

- The VOC survey revealed that the supervisor of the injured or ill person investigates only 60% of the incidents. Reported cases are primarily investigated by safety professionals with input from the supervisors. The system is designed to work in reverse.
- The J&J incident investigation system, Learning to Look[®] (LTL) is not institutionalized. The VOC indicates that 60% of the supervisors are not trained in Learning to Look.
- Twenty percent of our operating companies were not using the official incident investigation system.
- Solutions are not routinely shared among operating companies and franchises unless they are catastrophic.

3. Phase 3: analyze

3.1. Process door

In the analyze phase of DMAI²C, the goal is to develop theories of root causes, confirm the theories with data and finally identify the root causes of the problem.

- Detailed process maps.
- Value added analysis (what steps in the process add value to the customer).
- Cycle time analysis.

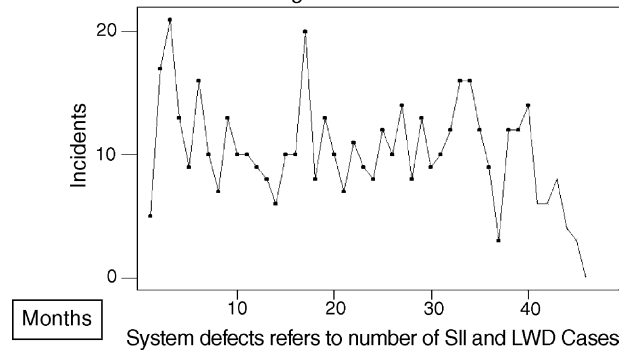
The purpose of this step is to:

- determine the performance of the current process;
- identify the process variables are and what are data collection opportunities;
- target problems and non-value added activities.

3.2. Analysis of 2001–2003 incident investigation data

In reviewing the reports for 2001, the team compared the number of defects (items that did not meet CTQs) to the number of possible opportunities. Process capability analysis were run on the total number of nonconformance for the year and on the number of defects defined per available opportunity to determine if the number was statistically significant. We discovered that we are stable and in control. The mean number of injuries for 2000–2003 is 10 per month. This is the same as our target year. If we continue to perform at these levels, we can expect to have an average of 120 (SIICs) and (LWDCs) per year at a cost of 3.8 million dollars. We need to take some action if the system is to improve.

Time Series Plot 48 Months 2000- Oct 2003
Looking for Trends and Anomalies

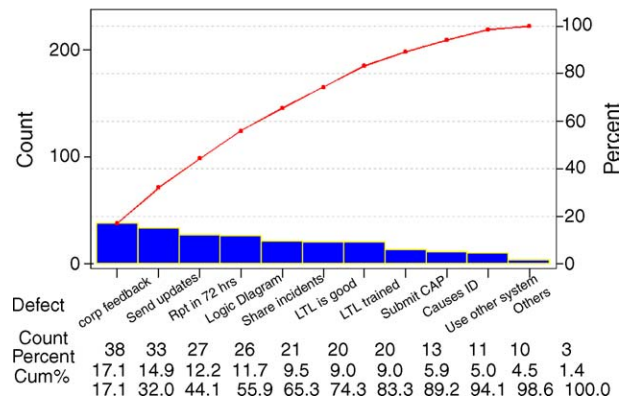


There appears to be no trend for SIICs and LWDCs 3.5 year period except for the final 6 months for the measurement period. Coincidentally, through the pilot, we introduced the Incident Reporting and Investigation (IRI) tool during the last six months of the study.

The system is stable, therefore, if we “continue to do what we have always done, we will continue to get what we currently have.” The system data has delivered the message, if we are to produce lower numbers of defects, the system must be improved.

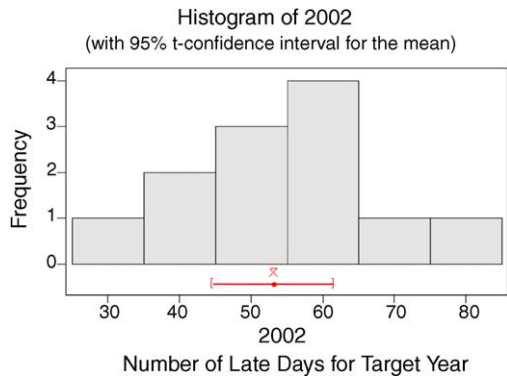
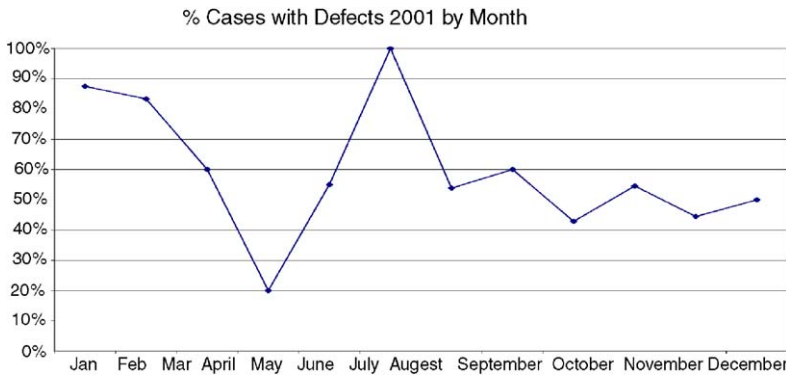
The expectation, without any change in process, is that we will have an average of 10 incidents per month or an average of 120 serious and/or lost workday incidents worldwide per year at a cost of US\$ 3,936,000.

Pareto Chart for Reason



The information gathered from the voice of the customer survey helped in understanding the weaknesses in the system. The biggest contributors were: lack of Corporate feedback; failure to follow-through with corrective actions; late reports; failure to use the logic diagram to think through causes; and failure to submit a corrective action plan that one was accountable for implementing.

3.3. Report and investigation defects



3.4. Notes

Defects were noted when any of the following conditions occurred:

- Late reports.
- Incomplete reports.
- Immediate, basic, and system causes not identified.
- Corrective actions not tied to identifiable causes.

Review of defects/opportunity data for reports over the specified time indicated a nonconformance rate of 20%.

4. Phase 4: innovative improvement

Once it was clear what some of the barriers to good investigations were, we began to use those elements to improve the system. We tackled each item one by one and provided a solution that would improve the process.

The solution evolved from in-depth analysis of the data including input from customers and stakeholders. It became clear that the following was needed.

1. An improved reporting system with built in accountabilities and time-bound mechanisms.
2. Clear online builder of the graphical depiction of the six-level cause–result logic diagram.¹¹
3. Corrective action planning tool.
4. Costing model.

The Incident Reporting and Investigation (IRI) was developed to address each system breakdown identified. The application was piloted among a group of seasoned J&J incident investigators in North America (NA), Europe, Middle East and Africa (EMEA) and Asia Pacific (AP). Based on the initial pilot several system enhancements were added and a second pilot run.

4.1. Critical to quality (CTQ) before and after improvements

Before	After
<p>The system was manual (paper)</p> <p>SIIC and LWDC investigative process did not integrate the LTL principles</p> <p>The reports could be sent in without all fields being completed</p> <p>The 72 h and investigation report did not facilitate an organized review of facts that lead to discovery of root cause</p> <p>The former system puts the investigator under pressure to complete the investigation within 72 h because there is only one report form</p> <p>The former process holds the investigator accountable for all activities</p>	<p>Web based</p> <p>The new process assimilates Learning to Look principles into the process</p> <p>The system will not permit a send until all fields are complete</p> <p>The new format follows a methodical review of the information by examining the sequence of events and linking them to earlier events</p> <p>The new process encourages the use of a collaborative process to determine cause and develop corresponding corrective action(s)</p> <p>The new process allows the investigator to assign responsibilities to others and each responsible party is held accountable for completing his or her assigned task</p>

¹¹ See Appendix G.

(Continued)

Before	After
The current process does not hold the investigation team accountable for submitting the reports on time	The new system has a series of embedded electronic messages that notify responsible parties when due dates are pending and or late The business leader and other interested parties are notified when reports or investigations are late.
The current system only asks for cursory generic information regarding the circumstances surrounding the incident. Many questions are asked that have no bearing on the incident in question	The new system is intuitive; the depth of the exploration into an area depends on the answers provided. The more one answers yes, the more in depth the questions get
Current practices do not ensure that there is a corrective action for each identified cause	The new system links the identified causes from the logic diagram directly to the corrective action plan (CAP). The investigator must decide on a corrective action for each identified cause
The current system does not require that the subject matter expert (SME) review the initial report or proposed solutions	The new system notifies the SME when an incident has occurred where the expertise of a technical expert may be valuable. It also permits the tracking of incidents related to the SME's area of expertise
The old process did not ensure that corrective actions were not changed and or not implemented after the reports are filed	The new system notifies the business leader and other appropriate individuals when a corrective action or due date is changed
The current system does not notify executives and other interested parties when all corrective action(s) have been implemented	The new system automatically notifies all interested parties when the last corrective action is implemented
Currently, only a few people are aware of the incident and its solution	The new process publishes the incident, logic diagram, solutions and relevant documents on the tools website (S&IH IRI), thus permitting the sharing of best practices
Storage of current incidents depends on submission of individual electronic documents or paper	The new system stores all information in a case file that is then part of a larger database. This ensures that documents are not lost or detached from the investigation. Reports, diagrams, and corrective actions can be printed or imported into other applications for display in various formats
The current system requires that those with access to the information review reports manually in order to do any type of analysis	In the new system, every field is searchable; therefore, analysis is simple and can be done by anyone

The improvement that resulted from this effort is an online Incident Reporting and Investigation system called the IRI¹² that assists the investigator in determining incident causes and appropriate solutions. The computer program divides the process into four distinct steps designed to address specific defects areas uncovered by the project:

- *Part I is the 72 h report:* In the former system, investigators felt pressure to get the entire investigation completed within 72 h because there was only one official report, even though there was an indicator box on the form to inform the reader that the report was not complete. One does not normally want to send a report to their senior management marked incomplete. Oftentimes a good investigation requires more than 72 h to complete. Our solution was to divide the report into two sections, the first report of injury or illness that is due in 72 h and the investigation that is due 10 days after the incident. This provides plenty of time for the investigator to gather the facts and develop a corrective action plan.
- *Part II is the cause–result logic diagram (LD):* In the former system, a LD was required but there was no easy way to display the diagram, and because of the small number of serious and lost workday cases, investigators got little skill practice in defining the three levels of causes learned in the “Learning to Look” incident investigation course. The online process walks the person through the logic of building the diagram with a series of drop-down boxes that suggest causes based on the type of incident under review. Definitions, at the point

of selection, help the investigators think through the process with their team. The investigator draws the diagram, with the help of the software, as causes are defined, taking the aggravation out of drawing the diagram after-the-fact. This will address one of the major errors we found: not correctly identifying causes.

- *Part III is the corrective action plan (CAP):* The former system did not ensure consistency between the causes identified and the corrective action plan. The new system links the causes from the LD to the corrective action plan ensuring that there is a corrective action for each cause identified. It also provides a template for presenting corrective actions.
In the old system, the investigator had no way of holding people accountable for corrective actions assigned to them, and management was not always notified when corrective actions were complete. The new system allows the investigator to assign corrective actions to others, and those assigned are responsible for tracking the corrective actions in the system. The new system sends the corrective action plan to management 10 days after the incident with the names of responsible parties and due dates. The system also notifies responsible parties when due dates are pending and management when due dates are missed.
- *Part IV is SafeCost:* SafeCost is an application that permits the investigator to determine the direct cost of an incident. This is not a new application; it has been available to investigators for some time. However, few elected to use it because it was a stand-alone application. The SafeCost application now links to the IRI, and it has been streamlined for this purpose making it much easier to use. This does not speak to defects but it was an opportunity to enhance the system significantly.




¹² IRI Incident Reporting and Investigation System.

5. Phase 5: control

All Safety professionals worldwide have been trained on the use of the IRI tool. This tool is now part of our staple of Health & Safety tools, and a core competency for new Health & Safety Professionals.

The incident investigation Standard Operating Procedure has been revised to include requiring use of the IRI application to enhance investigations. The system will be reviewed annually for process improvements and changes, and upgrades applied as applicable. The following dashboard will be used to determine if the process is in control.

5.1. Dashboard

	0–10% defects/opportunities—The process is on-target
	15–20% defects/opportunities—The process needs improvement
	>20% defects/opportunities—The process elements are unacceptable

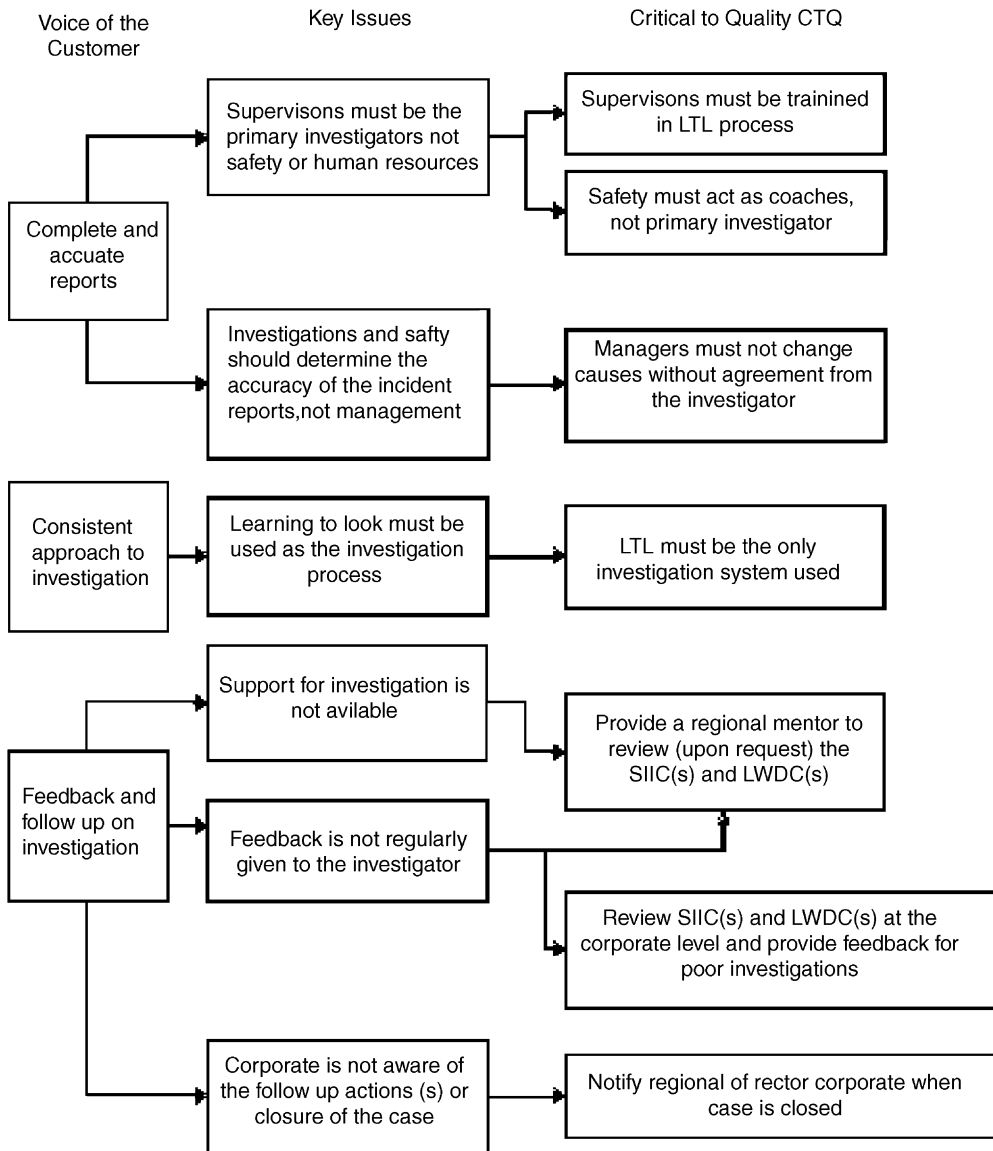
An in-depth analysis of the J&J incident investigation and reporting process indicated that there were weaknesses in the system that could be corrected by upgrading the efficiency of the process. In order to improve efficiency the defects needed to be defined, measured, and analyzed. The result of that work permitted us to develop an innovative improvement, the IRI application—a tool that can help us move to the next level in incident prevention and analysis. We will continue to monitor and evaluate the system with an eye towards improvement. Use of the DMAI²C principles provided a methodology for critically looking at the system and defining the necessary improvement opportunities.

Appendix A. Voice of the customer survey results

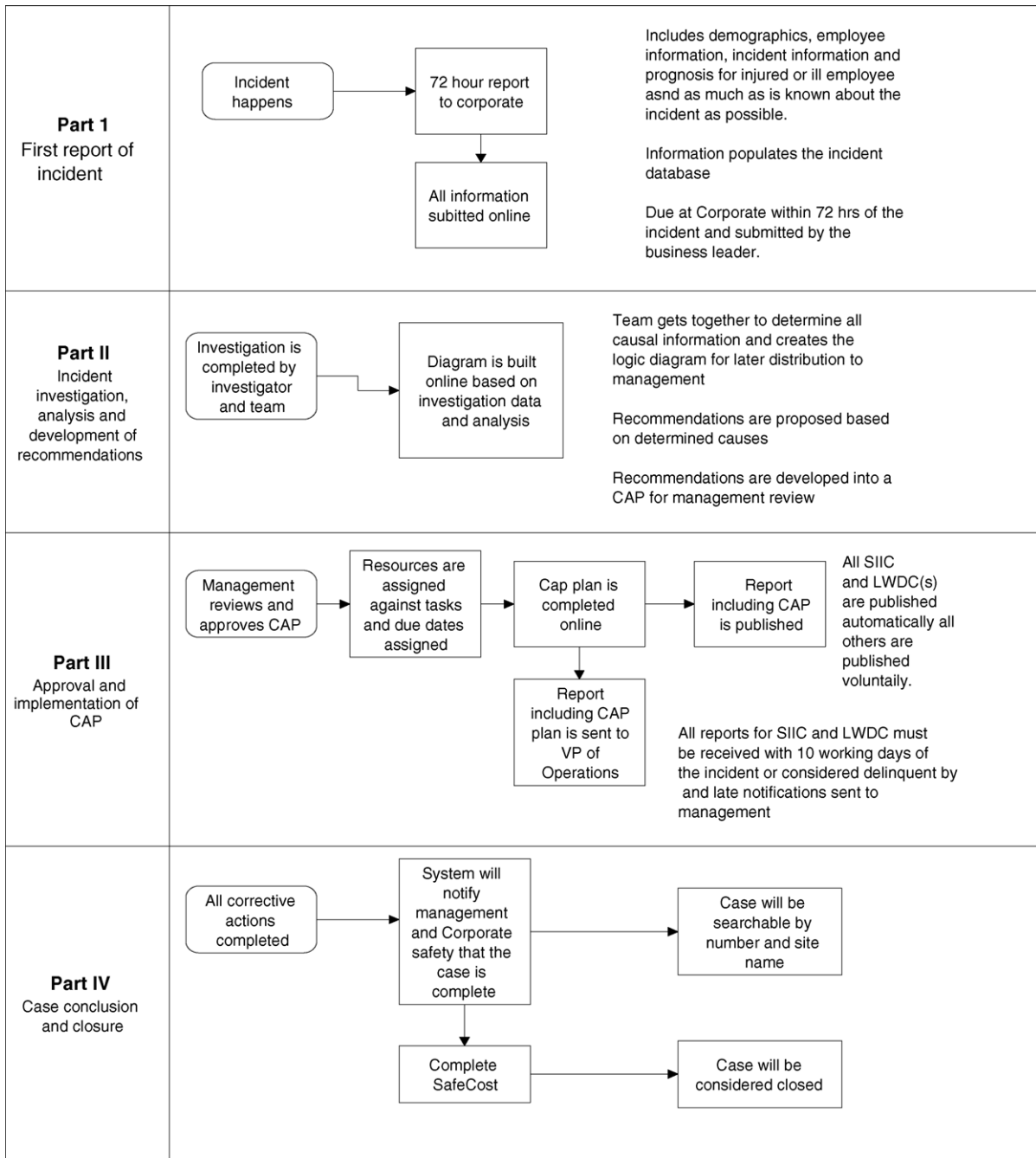
Process questions	Frequency (%)
Causes not identified (at the immediate, basic, and system cause levels)	22
Corrective action plan not submitted with the investigative report ^a	26
Cause–result logic diagram not submitted with the report	52
No substantial feedback from Corporate Health & Safety received	76
Report not filed within the required 72 h	54
No updates sent to Corporate	66
Incidents not shared with other sites or franchises	42
Investigators not trained in the J&J incident investigation process	40
Administration questions	Answers (%)
Send updates to VP S&IH	66
Share incidents with other sites	42
Supervisors trained in Learning to Look	40
Use the LTL principles for investigations	20
Enhancements questions	Answers (%)
Could investigators benefit from having coaches in the LTL process	48
Should incidents be posted for review	72
Would you like to have input from subject matter experts	66
Would feedback on the quality of your investigations be useful	48
Do you feel additional information such as pictures, diagrams and procedures are important to include in the report	60

^a Investigations showed that failure to submit a corrective action plans to Corporate did not mean a corrective plan did not exist; however, the requirement is submission of the plan.

Appendix B. Critical to quality (CTQ) tree



Appendix C. Process flow diagram for new process



Appendix D. Voice of the customer questionnaire

D.1. VOC definitions

Serious injury/illness: Any incident with one or more of the following outcomes: a death, an amputation, a fracture (other than hairline), inpatient hospitalization (other than for observation).

Lost work day cases: Any occupational injury or illness that result in an employee’s inability to return to work for his/her next scheduled shift or any subsequent shift.

J&J recordable cases: Any injury or illness that meets all the criteria of recordability as defined by J&J’s Safety Recordkeeping and Reporting System. These include all illnesses, all cases involving medical treatment, loss of consciousness, restricted work or motion, or transfer to another job.

First aid cases: Cases with minor medical consequences requiring only one time treatment, even though there may be subsequent medical visits for observation.

Property damage: As defined by company policy, which may vary.

Near-accidents: Incidents with the potential to result in Serious Injury/Illness and/or Property Damage, as defined above.

1. Who is responsible for SIIC & LWDC investigations at your site?			
- Safety	Yes <input type="checkbox"/> No <input type="checkbox"/>	<input type="checkbox"/>	
- Supervisor	Yes <input type="checkbox"/> No <input type="checkbox"/>	<input type="checkbox"/>	
- HR	Yes <input type="checkbox"/> No <input type="checkbox"/>	<input type="checkbox"/>	
- Other (explain)			Who:
2. Does a team do SIIC/LWDC Investigations?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	If yes, who is on the team?
3. Who determines that the report is complete and accurate?			
- Safety	Yes <input type="checkbox"/> No <input type="checkbox"/>	<input type="checkbox"/>	
- Supervisor	Yes <input type="checkbox"/> No <input type="checkbox"/>	<input type="checkbox"/>	
- HR	Yes <input type="checkbox"/> No <input type="checkbox"/>	<input type="checkbox"/>	
- Plant/General Manager	Yes <input type="checkbox"/> No <input type="checkbox"/>	<input type="checkbox"/>	
- Managing Director	Yes <input type="checkbox"/> No <input type="checkbox"/>	<input type="checkbox"/>	
- Other			Who:
4. Who at the site reviews the final report?			
- Safety	Yes <input type="checkbox"/> No <input type="checkbox"/>	<input type="checkbox"/>	
- Supervisor	Yes <input type="checkbox"/> No <input type="checkbox"/>	<input type="checkbox"/>	
- HR	Yes <input type="checkbox"/> No <input type="checkbox"/>	<input type="checkbox"/>	
- Safety team	Yes <input type="checkbox"/> No <input type="checkbox"/>	<input type="checkbox"/>	
- Plant/General Manager	Yes <input type="checkbox"/> No <input type="checkbox"/>	<input type="checkbox"/>	
- Managing Director	Yes <input type="checkbox"/> No <input type="checkbox"/>	<input type="checkbox"/>	
- Other			Who:

5. Are leading events, immediate, basic, and system causes identified before recommending solutions?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	See definitions
6. Do you submit a corrective action plan with your final report?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
7. What is the average time it takes to implement all aspects of the corrective action plan?	1-5 days	2 wks	>2weeks
8. Do you submit a logic diagram with your final report?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
If yes, who reviews the diagram before it is submitted?			Who:
9. Have you ever received feedback on the quality of your 72- hour report?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	From whom:
10. Do you always submit your 72-hour report within 72 hrs?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	If no, what are the greatest challenges to filing on time?
11. Do you ever submit an incomplete report and never follow-up with a completed report?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
12. Do you ever submit an update or status of corrective action plan?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	To whom:
13. Do you share incident data with other facilities?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	How:
14. Have you and/or the incident investigation team received training in "Learning to Look"?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
15. When do you use Learning to Look? Type SIIC= Serious injury/illness cases LWDC= Lost work day cases R = J & J Recordable	Type	All	See definitions
16. Do you feel that "Learning to Look" supports your investigation efforts? Please explain.	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
17. Do you use another system for investigating incidents?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
18. Would you like to have regional/franchise coaches available to assist with the investigations or with whom you can discuss your findings?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
19. Would you support an incident investigation web page where we share incidents, diagrams, and corrective actions?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
20. Would you like to have Subject Matter Experts available to assist you with recommendations/corrective action plans?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
21. Would you like to have a review team available to provide feedback on submitted reports?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
22. Would you be willing to be a reviewer?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
23. Do you include additional information with 72-hour report when it is considered complete? E.g. diagrams, pictures, corrective action plans (CAP)	Yes <input type="checkbox"/>	No <input type="checkbox"/>	What:
24. Additional Comments/Suggestions:			

Appendix E. Learning to Look definitions

E.1. Definitions of Learning to Look causes

Identification of all causes means that you have identified all the classification of causes listed below. Creating a corrective action plan (CAP) means that for every cause identified, a corrective action has been identified.

Leading events: The actions and/or inactions, of people and/or things that led up to the Incident.

“What actions and/or inactions, of people and/or things, led up to the incident?”

Leading events can take one of two forms—something that happened that should not have happened or something that did not happen that should have happened.

Leading events is a useful concept but may not apply to all incidents. For some incidents, it may be difficult to distinguish between a leading event and the incident itself. In such cases, the information recorded for the leading event will be the same as the information recorded for the Incident.

Immediate causes: The unsafe acts and/or unsafe conditions that allowed the Leading Events to happen.

“What unsafe acts and/or unsafe conditions allowed the Leading Events to occur?”

Basic causes: The personal factors and/or job factors that allowed the immediate causes to occur and/or exist.

“What personal factors and/or job factors allowed the immediate causes to occur and/or exist?”

System causes: The inadequacies in management systems and/or controls that allowed the basic causes to exist.

“What inadequacies in management systems and/or controls allowed the basic causes to exist?”

System causes usually fall under two broad categories: Policy/Procedure-related issues and Safety and Environmental Management-related issues.

Appendix F. Voice of the customer responses

Process questions	Compliance rate (%)
All causes are identified	78
Submit corrective action plan(s)	74
Submit a logic diagram(s)	48
Receive Corp feedback(s)	24
Report within 72 h	46
Follow up review and corrective action(s)	94
Administration questions	Answers (%)
Send updates to VP S&IH	34
Share incidents with other sites	58
Supervisors trained in Learning to Look	60
Use the LTL principles for investigations	80

Additional questions were asked about the process and the customer's view of the process. Customer input is an important part of process improvement.¹³

Enhancements questions	Respondent answers (%)
Could investigators benefit from having coaches in the LTL process	48
Should incidents be posted on the web for review	72
Enhancements (continued)	
Would you like to have input from subject matter experts	66
Would feedback on the quality of your investigations be useful	48

(Continued)

Enhancements questions	Respondent answers (%)
Do you feel additional information such as pictures, diagrams, and procedures are important to include in the report	60

Appendix G. Study definitions

G.1. 72 h Report

Report of the injury and or illness submitted on line within 72 h. It is not necessary to submit the final report until 10 days after the incident allowing ample time for the investigation.

G.2. Logic diagram

A six level diagram defining the results, incident, leading events, immediate causes, basic causes and system causes.

G.3. Corrective action plan (CAP)

- Corrective action for each cause identified in the logic diagram.
- A name associated with each corrective action.
- A date associated with every corrective action.

The CAP is due within 10 days of the incident. Once all CAP is completed, the case is published. A notification is sent to management and appropriate parties when the last item in the CAP is closed.

G.4. SafeCost

SafeCost is an online summary of the costs of the incident. There is no timeframe associated with SafeCost, but the case is not considered closed until it is filed.

G.5. Incident Reporting and Investigation System (IRI)

A computer program used to facilitate reporting and investigation of work-related incident.

¹³ The voice of the customer survey can be found in the appendix section of this document.

Appendix H

