Operational Emergency Categorization/Classification: A Process Improvement

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ABSTRACT

In accordance with the Los Alamos National Laboratory (LANL) Emergency Planning Implementing Procedure (EPIP) on Operational Emergency Categorization/Classification (Cat/Class), the occurrence of an operational emergency at LANL triggers an emergency response that includes Cat/Class. We analyzed the Cat/Class process for potential improvements to accuracy, verification and communication. We found that the process worked in some circumstance, while there were also opportunities for improvement. From this analysis, we simplified and streamlined the Cat/Class process.

INTRODUCTION

Categorization and Categorization (Cat/Class) of emergency events at DOE Facilities is required by DOE Order 151.1C, the Los Alamos National Security LLC (LANS) contract and the LANL EPIP 210. The objective of the Cat/Class process is to ensure that appropriate response and proper resources are employed during emergencies, and that efficiency and precision are maximized, with the result that life safety, the environment and assets at LANL are protected.

The Cat/Class process is an integral component of LANL emergency management (Figure 1). However, as part of a Yellow Belt Process Improvement project, we chose to conduct a critical analysis of the existing Cat/Class process. The goal of this project was to improve the average performance of the process.

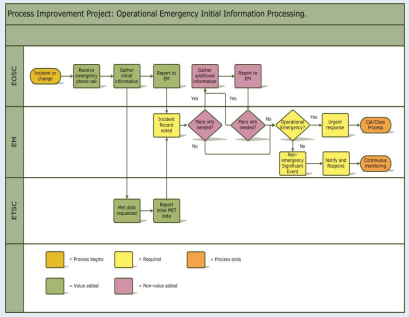


Figure 1. Initial process map.

Figure 3. Process steps and exercise objectives.

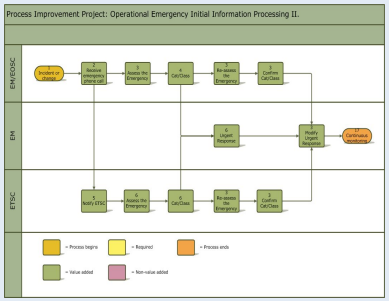
Cat/Class Process Step		Xs and Ys		Exercise Objectives from the After Action Report	
Number	Function	Ys	Xs	Objective	Definition
3	Gather info 1		X3	DEM.2.a	DEM uses DOT ERG/EALs/Facility Map to determine immediate PAs.
4	EM Report 1		X2	DEM.1d	DEM requests additional personnel (e.g. HazMat, HDT).
				DEM.2e	DEM contacts the EOC to assist, if necessary.
5	Request ETSC		X3	ETSC.1a	ETSC reviews EALs for their application to the emergency event.
				ETSC.1b	ETSC quantifies dose/conc vs distance to appropriate PASs...
6	ETSC Report	Y4		ETSC.1c	ETSC provides specific internal/external PAS recommendations.
				ETSC.1d	ETSC evaluates feasibility of Shelter-in-place and evacuation.
		Y5		ETSC.2a	ETSC reviews Cat/Class and makes any recommendations for upgrades.
7	Incident Record		X4	DEM.1b	DEM names the incident.
				DEM.4a	DEM transmits the initial Situation Report (SitRep).
				DEM.6a	DEM establishes Incident Action Plan (IAP).
9	Gather info 2		X5	ETSC.4a	ETSC staff provide updates to EMT, HazMat and IC.
				HAZMAT.2a	HMSO consults with IC, reviewing incident objectives.
				HAZMAT.4a	HMSO receives a brief from IC and develops exclusion zones.
10	EM Report 2		X6	HAZMAT.5a	HMSO advises IC of isolation zones and threatening hazards.
				HAZMAT.6c	HMSO identifies decontamination solutions.
12/15	Op Emergency / Non-OE	Y2		DEM.3a	DEM determines DOE O 151.1C Categorization and Classification.
13/16	Urgent/Notify	Y3		DEM.2c	DEM considers evacuation and/or Shelter-in-place.
				DEM.2d	DEM verifies accountability for personnel.
		Y3		DEM.5a	DEM makes notifications, as appropriate, for recommended offsite PASs.
				DEM.5b	DEM makes notifications, as appropriate, for an Operational Emergency...
14/17	Cat/Class / Monitor	Y2		DEM.3a	DEM determines DOE O 151.1C Categorization and Classification.

PROCESS STEP		FISCAL YEAR				Average	Scenario
Number	Function	FY08	FY09	FY10	FY11		
2	Receive call	73.7	73.7	77.8	83.3	77.1	
3	Gather Initial Info	76.5	55.6	66.7	57.9	64.1	X1
4	Report to EM 1	92.3	58.8	41.7	62.5	63.8	X2
5	Request ETSC	83.3	71.4	90.0	90.0	83.7	X3
6	Report ETSC	33.3	83.3	83.3	100.0	75.0	Y4, Y5
7	Incident Record	75.0	62.5	83.3	81.8	75.7	X4
9	Gather more info	33.3	33.3	35.3	35.3	34.3	X5
10	Report to EM 2	50.0	35.7	41.7	56.3	45.9	X6
12/15	Op Emerg / Non-OE	83.3	80.0	66.7	75.0	76.3	Y2
13/16	Urgent / Notify	21.1	35.0	21.5	47.4	31.1	Y1, Y3
14/17	Cat/Class / Monitor	90.0	72.7	100.0	75.0	84.4	Y2
Avg Success Rate		60.8	55.6	63.2	67.2	61.7	

= less than 50%
= 75% to 90%
= 50% to 75%
= greater than or equal to 90%

Figure 2. Process step performance and X-Y correspondence.

Figure 4. Final process map.



METHODS

The Emergency Operations Division (EO) conducts emergency exercises to test EO capabilities and responses during emergencies. EO exercises are graded by After Action Reports (AARs), which also provided data for this project.

We randomly selected twenty AARs from each of four fiscal years (FY08 to FY11). The objectives of the AARs were related to the individual steps in the Cat/Class process and as being either a Y (dependent) variable or an X (independent) variable (Figure 2). Then, the objectives were scored as being "met" or "unmet or opportunity for improvement". The performance of each step was rated by the percent "met" for each fiscal year.

The correspondence between process steps and AAR objectives were also established and designated as X or Y variables (Figure 3). X variables related to the input of information related to the emergency, while Y variables related to urgent response, the Cat/Class designation, and notifications. These results were used to evaluate the overall Cat/Class performance, suggest drivers that should improve performance, and implement these improvements into the process.

RESULTS

The overall performance of the Cat/Class process steps was 61.7 percent. Some variables performed consistently better than this average (X3 and Y2) while others performed less well (X5 and Y1, Y3). We hypothesized that an emphasis on X1, X2 and X3 would improve the performance of the Y variables. Moreover, X5 and X6 were considered to be non-value added. From this analysis, we simplified the Cat/Class process by eliminating decision points and non-value added steps (Figure 4). We also limited the number of communication steps, or made them automatic.

CONCLUSIONS

We found that the Cat/Class process worked well when emergency responses followed clearly defined, linear methods. Opportunities for improvements presented themselves when urgent responses required spontaneity, complex communications or decision-making between organizations. These results (Figure 4) were incorporated into the EPIP. We are currently validating these results by testing the performance of the X and Y variables in three EO functional exercises.

ACKNOWLEDGEMENTS

We thank Dave McClard, Rich Norman, Cynthia Renner, Monique Sanchez and Alan Woodward for their support and insights throughout this project.

LA-UR-12-20770