

# 2010 Copiapó Mining Accident – Chile



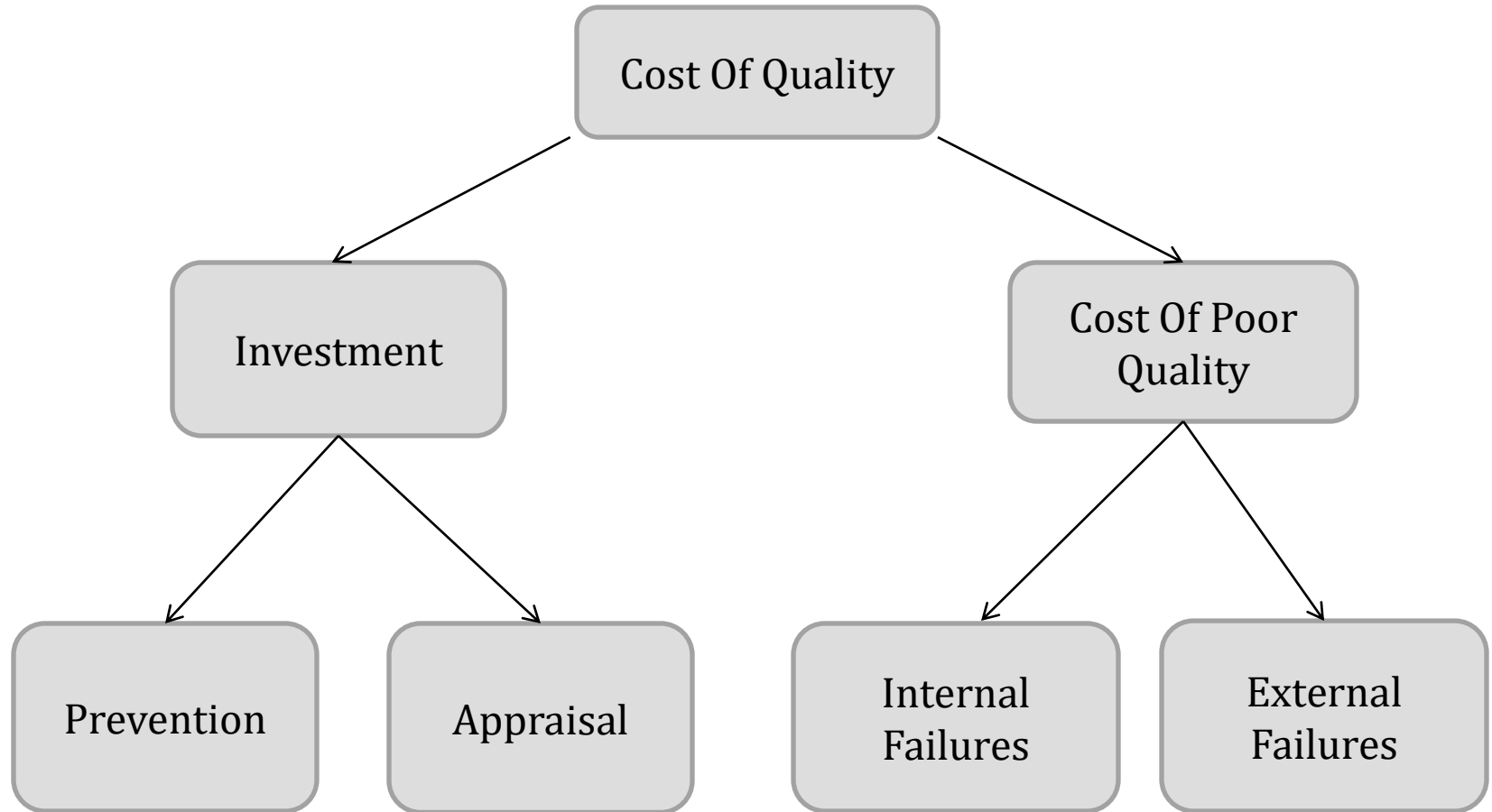
## TEAM - 1

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## PROBLEM STATEMENT

Failure to comply with mining standards and regulations resulted in a major mining accident (cave in).

# Introduction



# Background

- Owner: San Esteban Mining Company
  - Company was notorious for operating unsafe mines
  - 8 workers killed in past 12 years
  - the company was fined 42 times from 2004-2010
- Location:
  - Atacama desert, Chile
  - 33 Men trapped 700 m underground
  - Incident known as *Los 33 – Los treinta y tres*
- Rescue Operations:
  - 69 days – from August 5<sup>th</sup> 2010 – October 13<sup>th</sup>, 2010
  - cost \$20 million (USD)



# Cost of Poor Quality

## External Failure Cost

The cost that are incurred outside of the companies control

- Penalties due to poor quality
  - Fined 42 times between '04-'10
- Revenue losses in support operations
- Damages
  - Higher insurance cost
  - Decreased reputation
- Rescue Costs

## Internal Failure Cost

The cost that are incurred within the control of the company

- Scrap
- Safety Legislation
- Wedging fortifications not properly built
- Compensation
  - Health
  - Wages

# Methods

- HR training
- Plan of Action
  - Evacuation drills
  - Plan B (contingency plan)
- Better communication between unions and management staff
  - Proper communicate flows
- Internal inspector
  - Audits
  - Safety checks
- Enforcing better rules and regulations

# COPQ Continued

Annual Cost of Poor Quality – 2010 Mining Accident		
	Cost of Mining Accident	Cost if Considerations Implemented
<b>Internal Costs</b>		
Equipment/Materials	\$600,000	\$0
Compensations	\$2,000,000	\$0
Fines	\$42,000	\$0
Cost of Rescue	\$14,000,000	\$0
<b>External Costs</b>		
Cost of Insurance	\$400,000	\$200,000
Revenue Lost	\$1,000,000	\$0
Proper Safety Equipment/Training	\$0	\$100,000
Proper Mining Infrastructure	\$0	\$250,000
On-Site Safety Personal/Auditor	\$0	\$40,000
<b>Total Costs</b>	<b>\$18,042,000</b>	<b>\$590,000</b>

# Future Considerations

- Better equipped with resources
- Improving the safety standards of the workers
- Benchmarking
- Regular inspection (government)
  - 16 inspectors for approx. 4500 mines
- Take into consideration the history of the company

# Conclusion

- COPQ analysis
  - Reduction in internal and external costs
  - Reduction in number of accident
  - Improvement in efficiency
  - Improvement in safety and standards
  - Better quality checks



# References

- [http://en.wikipedia.org/wiki/2010\\_Copiap%C3%B3\\_mining\\_accident](http://en.wikipedia.org/wiki/2010_Copiap%C3%B3_mining_accident)
- <http://alborada.net/herrerros-chile-mining-neoliberal-0810>
- <http://worldnews.about.com/od/chile/f/Why-Is-The-Rescue-Of-The-Miners-In-Chile-Taking-So-Long.htm>
- [http://www.tucsonsentinel.com/nationworld/report/083110\\_chile\\_mine/poor-safety-standards-led-chilean-mine-disaster/](http://www.tucsonsentinel.com/nationworld/report/083110_chile_mine/poor-safety-standards-led-chilean-mine-disaster/)
- <http://www.juancole.com/2010/10/top-ten-questions-about-chile-mine-collapse-was-it-nixon-kissingers-fault.html>