

OPPORTUNITY

Risk Engineering News

Quarterly Newsletter

June 2017— Volume 2 Edition 2

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Risk Engineering Society

President's Update

Hello colleagues in RISK and welcome to the second edition of OPPORTUNITY for 2017.

There is a lot happening within and external to the RES.

At our May RES National Committee reports showed that our CPD programs are well underway in all chapters. Well done to the local organising committees.

Please pass on the program notices to your colleagues to come along to sessions that are relevant to them as visitors are welcome. This helps improve the value of the work our volunteer organisers put into setting up these events as well as reaching out to the wider community and inform them on what risk engineering is about.

The Program Controls Conference 20-22 September in Sydney is taking early bird registrations for the rest of June for what is

an amazing program for anyone involved in implementing projects of any size. You will shortly receive a PCC flyer. Please distribute this widely so that no one misses out on this value for time and money event. I look forward to seeing many of you there. Maybe put a table of colleagues together for the conference dinner or say hello at the exhibition.

In this issue you will see the invitation to contribute to the review of the 'Cost Estimation Guideline Note 3A' being prepared by the Department of Infrastructure and Regional Development. Also information on the DRMR PCR by John Fitzgerald and the summary presentation of the LOPA tool for assessing hazard control by Kate Flippin and Elio Stocco. Thank you for these contributions to this edition.

The Women In Engineering Newsletter will again be promoted by RES by distribution to RES members this month. It is a national WIE newsletter, so please make an

OPPORTUNITY to promote and support WIE by sharing this publication as well.

Thank you for your ongoing support.

Geoff Hurst (President)

QUARTERLY NEWSLETTER

The Risk Engineering Society is a Technical Society of Engineers Australia.

For Engineers Australia members, please remember to nominate your membership of RES when you renew your membership. NB: Non EA members can also join RES.



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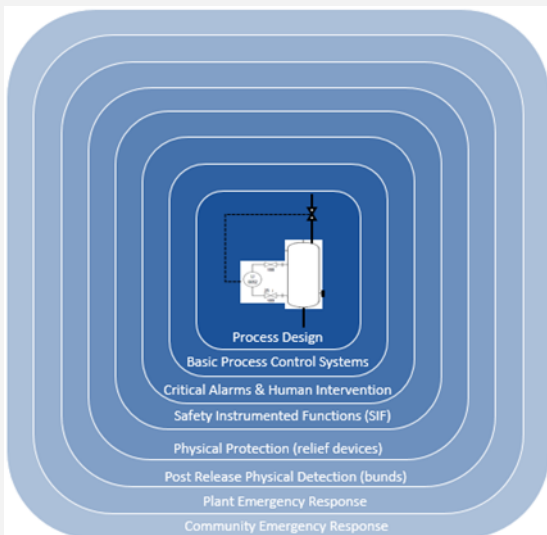
LOPA - Managing Hazardous Events

Authors: Kate Filippin and Elio Stocco. Both Kate and Elio are process safety experts with extensive experience in the application of LOPA.

In process risk management, LOPA has become the acronym of choice. Standing for 'Layers of Protection Analysis', it describes a technique used to assess whether a hazard is adequately controlled.

The technique was developed to aid in answering questions around how much 'protection' is required to adequately reduce the risk of an incident. It has developed into a tool widely used in the process industries to aid the demonstration that risk controls are in place, are effective and will adequately prevent an unwanted incident from occurring.

The main purpose of LOPA is to assess that sufficient layers of control (or protection) are available to prevent a hazardous incident from occurring. If one layer fails, there are other layers that will provide protection. As illustrated below, there are many types of protective layers. (Ref1) A scenario may require a single type of protection, or a combination of layers, depending on the complexity of the process or severity of the consequence of an incident.

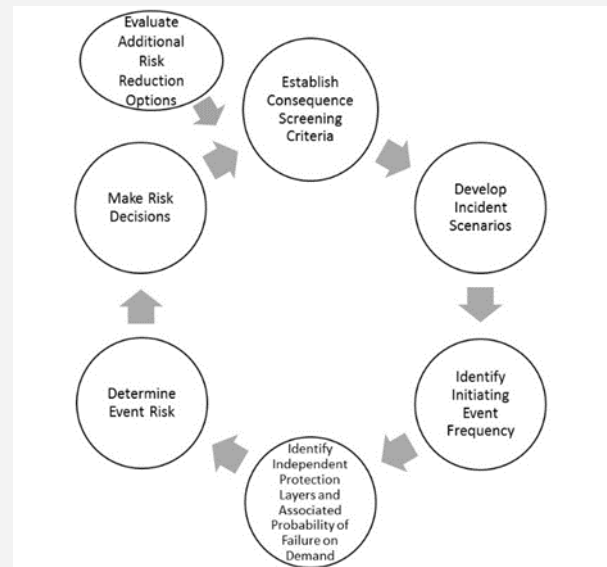


As a risk assessment tool, LOPA fits in between simplified qualitative techniques (such as a simple risk matrix) and complete quantitative assessment (QRA). It is a semi-quantitative tool, using order of magnitude approximations to evaluate the risk. It builds on information developed during a qualitative hazard identification study, such as a Hazard and Operability Study.

LOPA is appropriate where additional risk quantification is required due to the potential severity of the consequences, but where there is no need for a full quantitative assessment. The time and cost to complete a LOPA is greater than a simplified qualitative analysis but far less than for a QRA. LOPA also provides very clear linkages between causes, controls and outcomes, considers the effectiveness of individual controls and can be used but far less than for a QRA. LOPA also provides very clear linkages between causes, controls and outcomes, considers the effectiveness of individual controls and can be used to demonstrate that the controls are adequate by using simple risk criteria.

The LOPA process is implemented using a set of rules. It is most effective when a consistent approach is applied and criteria have been set for when to use it.

The steps involved in the LOPA process are represented in the following diagram.



- ◆ **Establish Consequence Screening Criteria**
A first step in the LOPA study is to screen scenarios, usually based on the magnitude of the consequences.
- ◆ **Develop Incident Scenarios**
A scenario describes a single cause-consequence pair.
- ◆ **Identify Initiating Event Frequency**
Each scenario has an initiating event (IE) that leads to the consequence. A frequency is estimated for the IE, based on operational knowledge and industry data.
- ◆ **Identify Independent Protection Layers and Associated Failures**
All independent protection layers between the IE and the consequence are identified. Each layer is assigned a probability of failure on demand.
- ◆ **Determine Event Risk**
The risk is determined by combining the data from the consequence, initiating event and independent protection layers.
- ◆ **Make Risk Decisions**
The tolerability of risk can be evaluated based on the outcome.
- ◆ **Evaluate Additional Risk Reduction Options**
Additional protection layers can be proposed and evaluated to assess their effectiveness in further reducing the risk.

The LOPA process is limited to evaluating a single cause consequence pair as a scenario. However, multiple incident causes and outcomes may be represented in a bow-tie diagram.

RES Snippets



**RISK ENGINEERING
SOCIETY**

Con't from page 2...

LOPA is generally undertaken in a team setting, with a suitably experienced facilitator and a range of knowledgeable operations and process personnel.

Organisations that have implemented the LOPA process as part of their risk management strategy have been rewarded with a practical method for effectively reducing their risk, managing their controls and demonstrating their systems are adequate.

To register for one of R4Risk's scheduled LOPA training sessions or more information on implementing LOPA in your organisation, please visit www.r4risk.com.au or email training@r4risk.com.au

Ref 1. Centre for Chemical Process Safety (CCPS) (2001), "Layer of Protection Analysis, Simplified Risk Assessment" New York: American Institute of Chemical Engineers

Interested in contributing to future editions of **OPPORTUNITY**—
Risk Engineering News?

Please submit your article via email to:

res@engineersaustralia.org.au

**CUT OFF FOR NEXT EDITION: 25
AUGUST 2017**



**PROJECT CONTROLS
CONFERENCE
SYDNEY 2017**
20-22 September | ICC SYDNEY
projectcontrols2017.com.au

The logo for Engineers Australia, featuring a red shield with a white 'E' and the text 'ENGINEERS AUSTRALIA' below it.

Engineers Australia together with the Australian Cost Engineering Society (ACES) and the Risk Engineering Society (RES) are hosting the Project Controls Conference in Sydney this September exploring the theme **"Improving maturity in Project Controls - keeping investments on track"**. Under the three streams People, Process and Technology, covering all aspects of Project Controls across different industries and sectors.

**** Early bird registrations close on 26 June 2017 ****

To contact us: projectcontrols2017@engineersaustralia.org.au

Website: www.projectcontrols2017.com.au

Review & Comments on Draft

'Cost Estimation Guideline Note 3A'

As you are aware, our *RES Contingency Guideline* (<https://www.eabooks.com.au/Risk-Engineering-Society-Risk-Guidelines>) was prepared and released by RES in May 2016. That successful initiative, undertaken by a dedicated team of volunteers, was also strongly supported by a number of public and private organisations nationally including the Department of Infrastructure and Regional Development.

The Department is now seeking RES views and feedback on the Guidance Note 3A.

RES national executive committee has nominated Pedram Danesh-Mand, its NSW President, to lead this response on behalf of RES. Please provide your views/comments/feedbacks or suggestions to res@engineersaustralia.org.au and Pedram.DaneshMand@jacobs.com by 30th June 2017.

Download from: <http://investment.infrastructure.gov.au/whatis/costestimation/index.aspx>

Targeting Project Risk By Applying Context Profiling

The Department of Transport and Main Roads (DTMR) is an integrated transport planning delivery and operational agency of the Queensland Government. It is responsible for managing the largest state road networks in Australia, with more than 33,300 kilometers' of state controlled roads, 7000 kilometers' of rail, and more than 7000 bridges under management. With more than \$7 billion of major projects under construction, or at various stages of planning across an area larger than Western Europe, a systematic and coordinated approach to risk management is essential.

The DTMR project risk management section, comprising both engineers and risk specialists, is located in the 'Program Management and Delivery (PDM)' area of 'Program Delivery and Operations (PDO)'. All risk team members had witnessed a general trend for project risk registers' to contain a high number of

risks many of which could be perceived to be minor or as 'business as usual'. The team agreed that all projects' delivered in Queensland would share common risk context areas. But how to substantiate such an assumption? Solution? Identify those project managers and engineers within DTMR who had the experience of delivering such projects across the state. This process of identification and discussion with such key people was carried out over an extensive period of time. Not only were subject matter experts in Brisbane consulted but also key personnel throughout the 12 geographical districts comprising the DTMR delivery system. As an indication of the rigorous assurance process applied the ultimate identification of the 10 key risk categories progressed through 10 iterations.

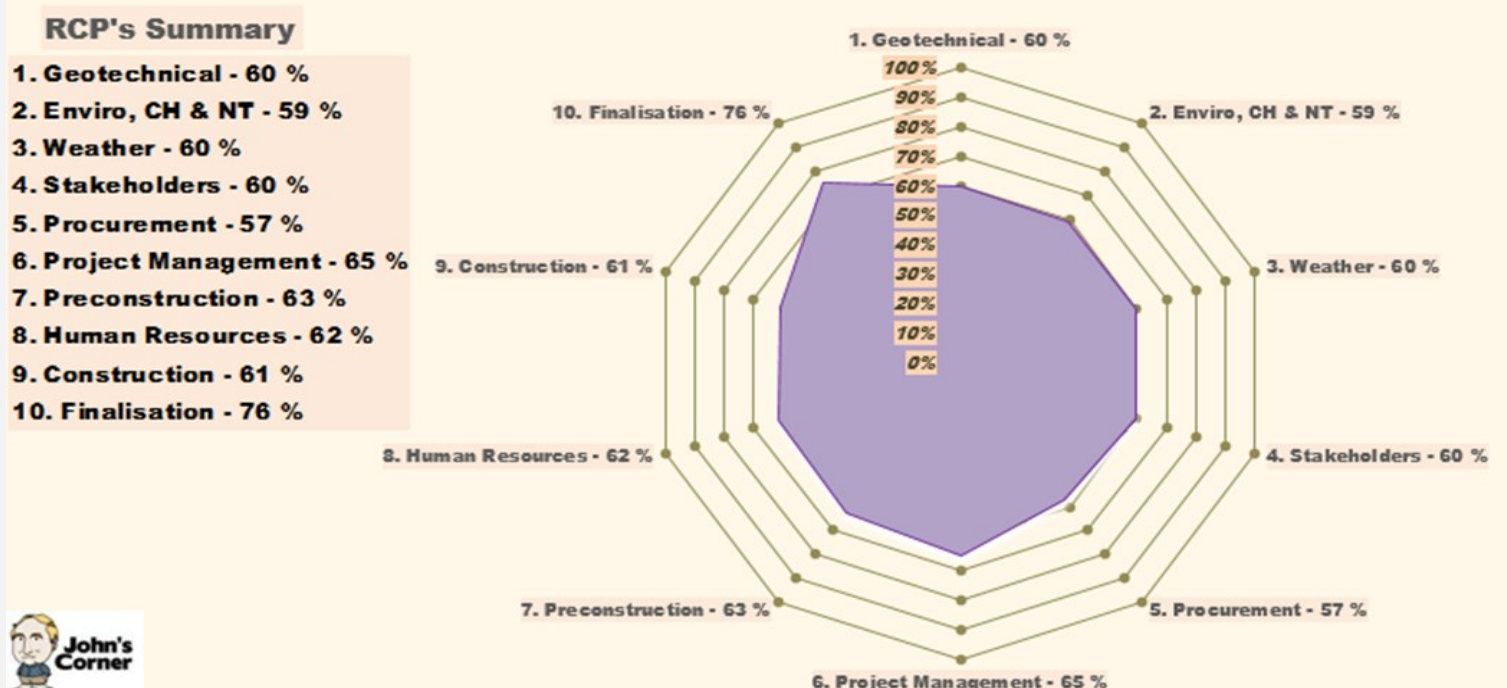
Each contextual risk category is embedded in a self-populating excel spreadsheet. The consequence and

likelihood of a category reflects the DTMR risk matrix resulting in a risk level ranging from extreme to low. This assessment process also applies to associated areas listed within the category thereby providing a comprehensive capture of all elements comprising that category. Each RCP provides an overall % score as reflected in the diagram below.

Consequently, a project management team can quickly focus on those high key risk context categories for the purposes of identifying, analyzing, assessing, and treating key project risks for placement in the project risk register.

Author: John Fitzgerald

Manager (Risk) Program Management and Delivery—Dept of Transport & Main Roads





Professional Development

For EA members, RES Technical presentations contribute to your CPD. Ensure you register for the events and sign the attendance register.



Upcoming Events 2017

RESERVE THESE DATES IN YOUR CALENDAR!

- ◆ 14 June (NSW) - Roads & Maritime Services, Health & Safety in Design—What you need to know and do.
- ◆ 20 June (East Lismore) - Chartered Status Information Session
- ◆ 20 June (QLD) - Development of Risk Assessments
- ◆ 15 August (VIC) - The Future: What Chemists Can Do About It (Joint with RACI) - To be held at MFB Facilities at Burnley
- ◆ 29-30 August (VIC) - Regional Risk Symposium (Benalla)
- ◆ 20-22 Sept (NSW) - Project Controls Conference

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