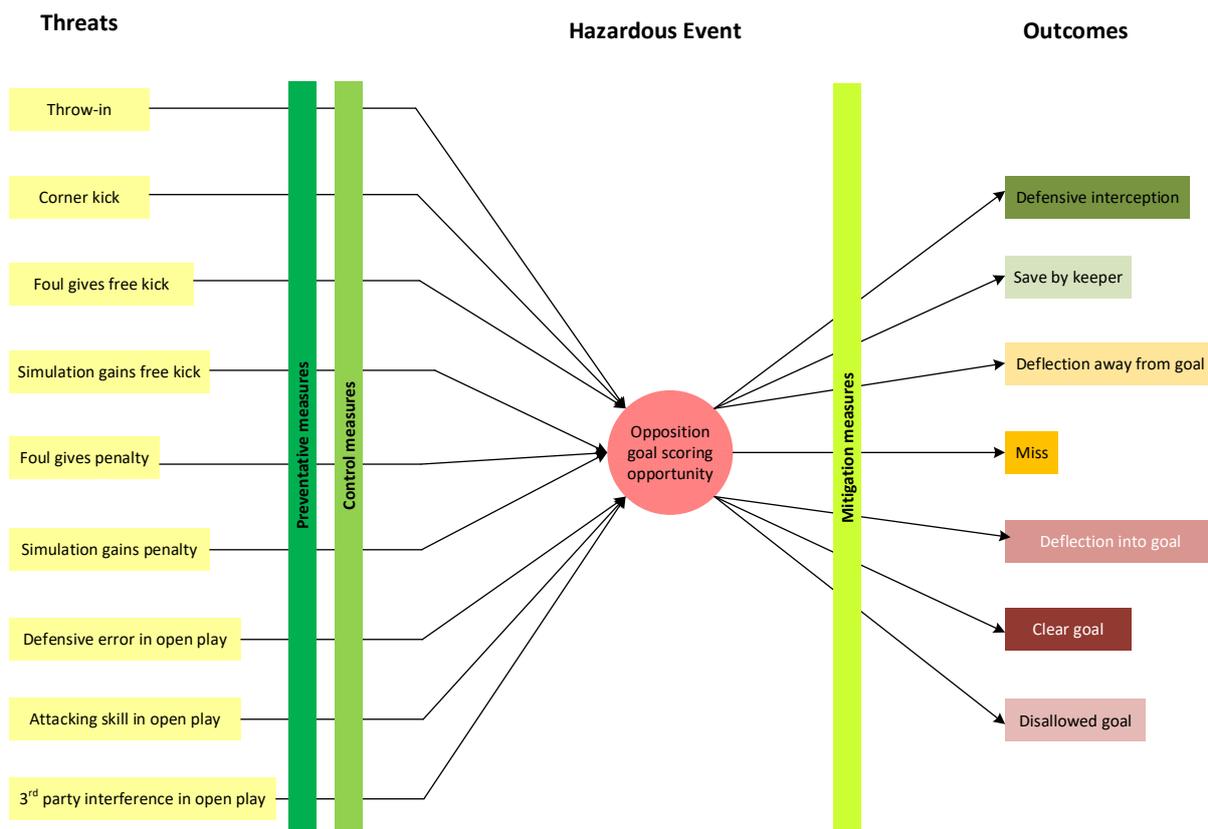




Goal! – What went wrong? What went right?

An example of a risk management approach to football is to consider opposition goal scoring opportunities as hazardous events. A range of threats have the potential to lead to the hazardous event and there are a range of outcomes that could lead from the hazardous event. The picture below illustrates this using a barrier model (i.e. Bow Tie Analysis) showing the various threats and outcomes together with preventative, control and mitigation measures as the barriers which the threat progresses through to the hazardous event and then to outcomes. The effectiveness of the barriers determines whether a threat is prevented, stopped or the outcome reduced in severity.



What do the barriers look like?

The barrier appearance and condition is a combination of:

1. The barrier itself (the preventative /control /mitigation measure);
2. The position, number and size of holes within the barrier which is comprised of:
 - a. Causes of holes (latent or local in time and place);
 - b. Measures to prevent or detect, diagnose and repair holes.

When holes in barriers line up, this provides the trajectory for threats to progress via a hazardous event to an outcome (as per Reason's Swiss Cheese Model).

For the opposition goal scoring opportunity barrier model, some example preventative measures (to prevent the threat occurring):

- Possession in attack;
- Possession in midfield;



- Possession in defence.

Some example preventative /control (to prevent the threat occurring **or** reduce the likelihood and /or severity of the threat progressing to the hazardous event) measures are:

- Individual player competency including physical skills (e.g. fitness, speed, athleticism, ball control skills); ability to play within the rules and regulations of football; cognitive skills (e.g. assimilating information, interpreting information, decision making, detecting own errors); interpersonal skills (e.g. clarity of language, communicating critical information, soliciting information, active listening); team management skills (e.g. achieving common purpose, work distribution /delegation, influencing, co-ordination, detection of errors by others); behaviours (e.g. leadership, consistency, awareness of priorities, appreciation of standards, awareness of own limits);
- Team competency including balance of skills and experience, definition and understanding of roles and responsibilities, preparedness for range of match play scenarios and threats, provision of leadership, co-ordination and direction;
- Individual official competency including physical, ability to apply the rules and regulations of football, cognitive, interpersonal, team management and behaviours.

Some example control measures (to reduce the likelihood and /or severity of the threat progressing towards the hazardous event):

- Intervention outside 18 yard box;
- Force attack out wide /less attractive path and position.

Some example mitigation measures (to reduce the likelihood and /or severity of the hazardous event progressing to outcomes):

- Intervention by outfield player inside 18 yard box;
- Goalkeeper intervention.

Note: The above control and mitigation intervention barrier definitions indicate that an opposition goal scoring opportunity (hazardous event) has been defined as an attack progressing to the home team's 18 yard box.

There are ways that the barriers can be undermined and provide 'holes' for a threat to progress through (termed escalation factors in Bow Tie Analysis), for example:

- Fatigue of individual players and officials;
- Injury of individual players;
- Weather conditions affecting pitch condition /visibility /player and official physical wellbeing;
- Reduced player competency due to lack of match /training practice;
- Loss of player(s) through being sent off (loss of competency and reduced number of players);
- Change in individual players through injury or substitution weakening the home team or conversely strengthening the opposition.

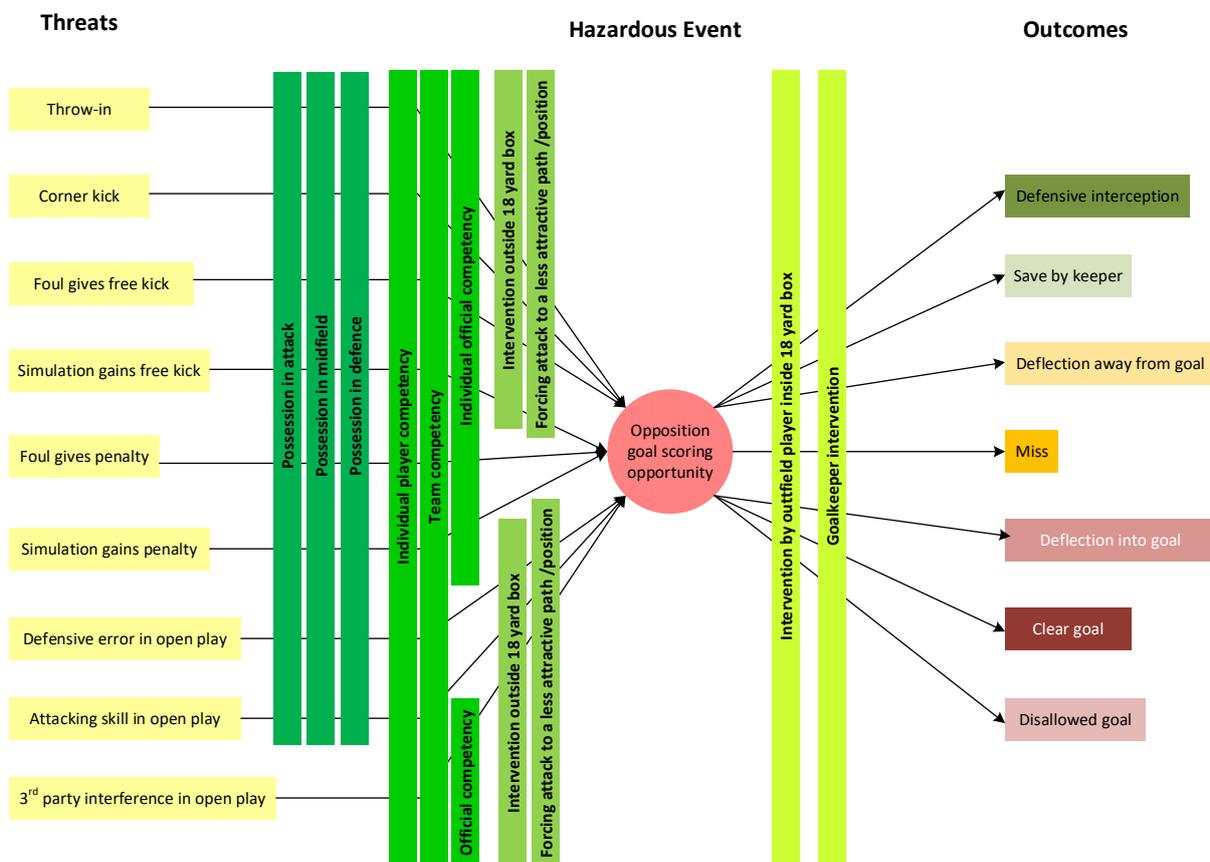
The barriers can be strengthened further to prevent the above 'holes' occurring or to detect, diagnose and repair them (termed escalation factor controls in Bow Tie Analysis), for example:

- Adequate conditioning of players and officials for the range of foreseeable match and playing conditions;



- Adequate rest, refreshment and treatment of players and officials prior to, during and after training and matches;
- Adequate medical support for players;
- Adequate pitch design and maintenance;
- Adequate player and official clothing (e.g. colour, breathability);
- Adequate criteria used for squad and team selection;
- Adequate internal disciplinary standards and arrangements for all players;
- Adequate practise with range of foreseeable home team permutations against range of foreseeable opposition team permutations.

Opposition goal scoring opportunity barrier model showing top level of barriers (Note: gaps in Preventative /Control barriers are where they do not apply to a Threat)



Using the barrier model to measure performance and drive continuous improvement

A barrier model for a hazardous event can provide a framework for analysing patterns within incidents that involve one or all of a threat, hazardous event and outcome. Such analysis enables insight into how often a family of scenarios is being experienced (despite normally no adverse outcome occurring), the distribution of threats and outcomes and how critical and effective each preventative, control and mitigation barrier is. The analysis would include the following at the top level, drilling down as necessary (i.e. keep asking why) to aid understanding and enable continuous improvement:

1. Every incidence of each threat;
2. Incidence of the hazardous event;



3. Incidence of each outcome;
4. Barriers that were tested and worked well /moderately /poorly /failed;
5. Barriers that did not contribute to prevention, control or mitigation.

Additionally, such analysis should always ask: **Does the model need modifying and improving?** The updated, improved model can then be fed into the management system to improve risk management of the hazardous event and into any safety case so that it remains accurate and aligned to operation.

Using the opposition goal scoring opportunity barrier model

The model could be used to improve individual player and team performance in preventing opposition goal scoring opportunities or prevention of opposition attack via analysis of exercises during practice (i.e. incident exercises) and analysis of matches (i.e. incidents and near misses). This section includes a proforma which can be populated based on actual World Cup matches and goals.

To identify the threat for each incident (threat occurrence whether it progresses to an opposition goal scoring opportunity i.e. hazardous event or not) and the outcome where applicable (only if a hazardous event occurred in that incidence of the threat) please use the relevant code as shown below.

Threat	Threat Code	Outcome	Outcome Code
Throw-in	TI	Defensive interception	DI
Corner kick	CK	Save by keeper	SK
Foul gives free kick	FF	Deflection away from goal	DA
Simulation gains free kick	SF	Miss	M
Foul gives penalty	FP	Deflection into goal	DG
Simulation gains penalty	SP	Clear goal	CG
Defensive error in open play	DE	Disallowed goal	NG
Attacking skill in open play	AS		
3 rd party interference in open play	TP		

For assessing preventative, control and mitigation barrier effectiveness a simple anchored rating scale can be used (supplemented by further quantitative and qualitative data as available and required):



Descriptive anchor	Rating
Best practice, fulfilled requirements of very good and was further optimised as an outcome post incident	5
Very good, worked effectively when challenged and was key in prevention /control /mitigation of incident	4
Good /acceptable /effective, not challenged during incident	3
Insufficiently robust for circumstances so limited in effectiveness, contributed to incident occurring	2
Poor /absent /ineffective so no discernible benefit	1
Not applicable	0

Therefore, for each threat occurrence input your assessed rating for the relevant barriers.

An example incident is completed in the first row of the table where:

- I. A **threat** arose from opposition attacking skill in open play **[AS]**;
- II. Home team possession in attack was insufficiently robust and led to the threat occurring **[2]**;
- III. Home team possession in midfield **[3]** and defence **[3]** was effective (e.g. sufficiently high and skilful) but not tested during the incident;
- IV. Individual **[4]** and team competency **[4]** worked well and contributed to the effectiveness of other barriers in events VII and IX;
- V. Individual official competency was effective (e.g. followed play at appropriate positions) but not tested during the incident **[3]**;
- VI. There was no credible opportunity for intervention outside the 18 yard box **[0]**;
- VII. The threat was forced to a less attractive attack path and position **[4]**;
- VIII. The threat progressed to an opposition goal scoring opportunity (**hazardous event**) **[Y]**;
- IX. The hazardous event's severity was reduced via an intervention (clearance) by an outfield player inside the 18 yard box **[4]**;
- X. The goalkeeper was effective (e.g. moved into position to make a save if required) but not tested during the incident **[3]**;
- XI. The **outcome** was a defensive interception **[DI]**.



Match **Date** **Start-time** **Team 1 (Home)** **Team 2 (Opposition)**

Threat occurrence (incident)	Threat	Preventative and Control Measures								Hazardous Event? Y / N	Mitigation Measures		Outcome Only applicable when Hazardous Event has occurred
		Possession in attack	Possession in midfield	Possession in defence	Individual player competency	Team competency	Individual official competency	Intervention outside 18 yard box	Forcing less attractive attack path and position		Intervention by outfield player inside 18 yard box	Goalkeeper intervention	
Example	AS	2	3	3	4	4	3	0	4	Y	4	3	DI
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													

Suggestions to modify and improve the model:

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Final thought...for now!

The opposition goal scoring opportunity barrier model could be 'flipped' to create a home scoring opportunity model using different terminology such as: Opportunities rather than Threats, Enablers (with the three types being for example, Creative, Progress, Conversion) rather than Barriers and Advantageous Event rather than Hazardous Event. What do you think this might look like?