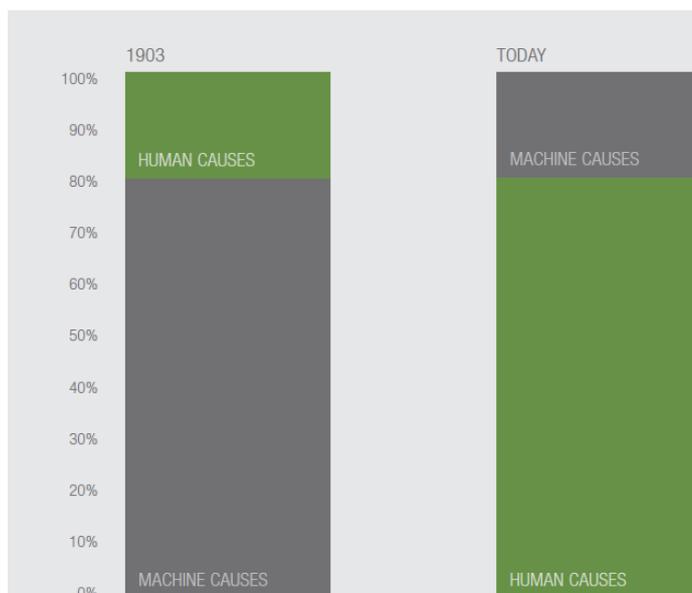


## Promoting Safety Awareness with Just Culture - Case Study of China Airlines

中華航空機務品保處

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From mankind first flight of Kitty Hawk in 1903 to the first flight of A380, the largest passenger aircraft in 2005, just within a century, aviation industry has been developing rapidly, flying is no longer a dream but part of our daily life. Compare to other methods of transportation, by far, air transportation has been proven the safest way of travel. However, throughout the past century, the cause of aircraft accident due to human cause has been increased from 20 percent to 80 percent. This data does not mean human is making more mistakes than before, but simply means the aircraft (machine) is getting more consistent and reliable with the advances of technology and with the stricter aviation regulations on design, manufacturing, and maintenance. When machine performance is getting more consistent and more reliable, human performance becomes the weak link in flight safety, the Dirty Dozen first introduced by Transport Canada is the well summarized causes of error in Human Factors, one of the Dirty Dozen is Lack of Awareness. How to avoid the lack of awareness or should say how to increase the safety awareness of the staff in order to prevent accidents from happening is critical.



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Cause of Accidents (Boeing AERO Magazine)

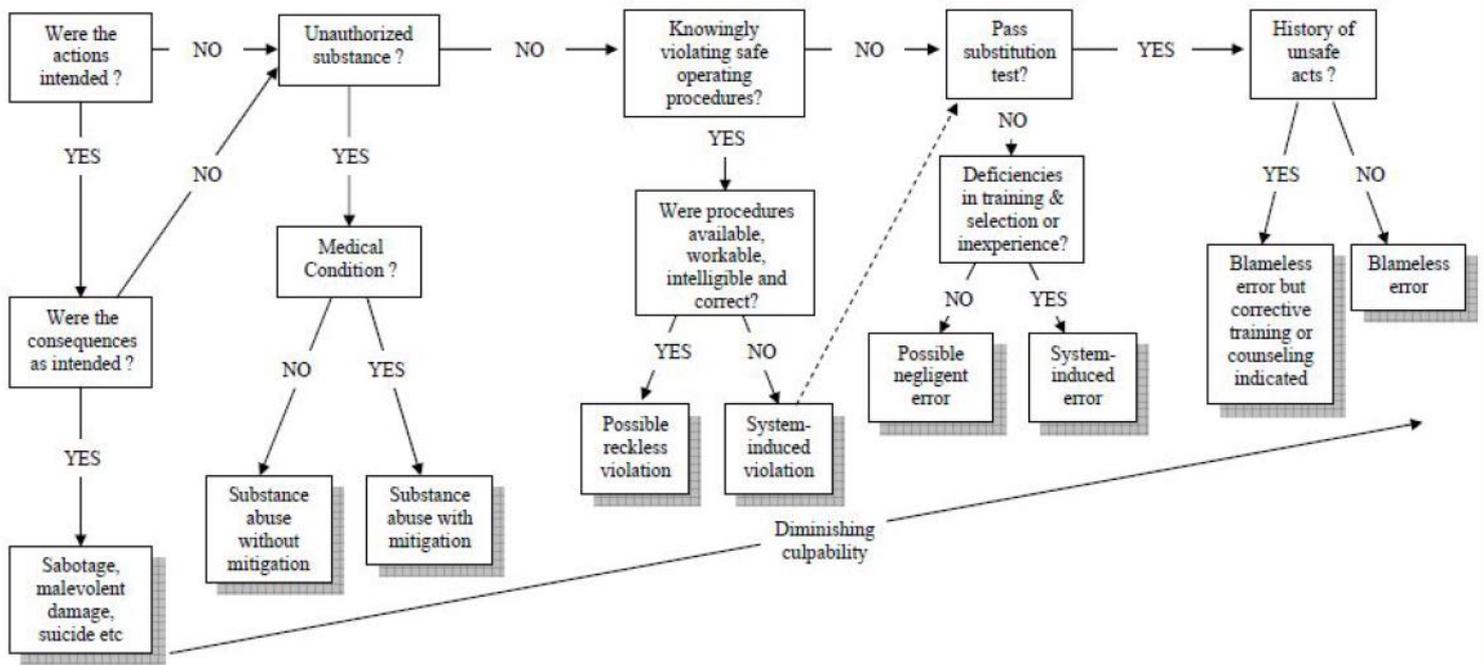
Lack of awareness could leave the hazards, safety concerns or errors around the working area unattended and eventually lead to accidents. The safety awareness is critical in eliminating the hazards, and safety concerns, the concept here is very simple, know where the problem is, report the problem, and solve the problem. However, know how to do the job does not necessarily mean the job will get done, how to encourage staff to be more aware of their surrounding safety concerns or hazards and also report those concerns and hazards are critical factor of success. The Just Culture can

just be the right tool for it.

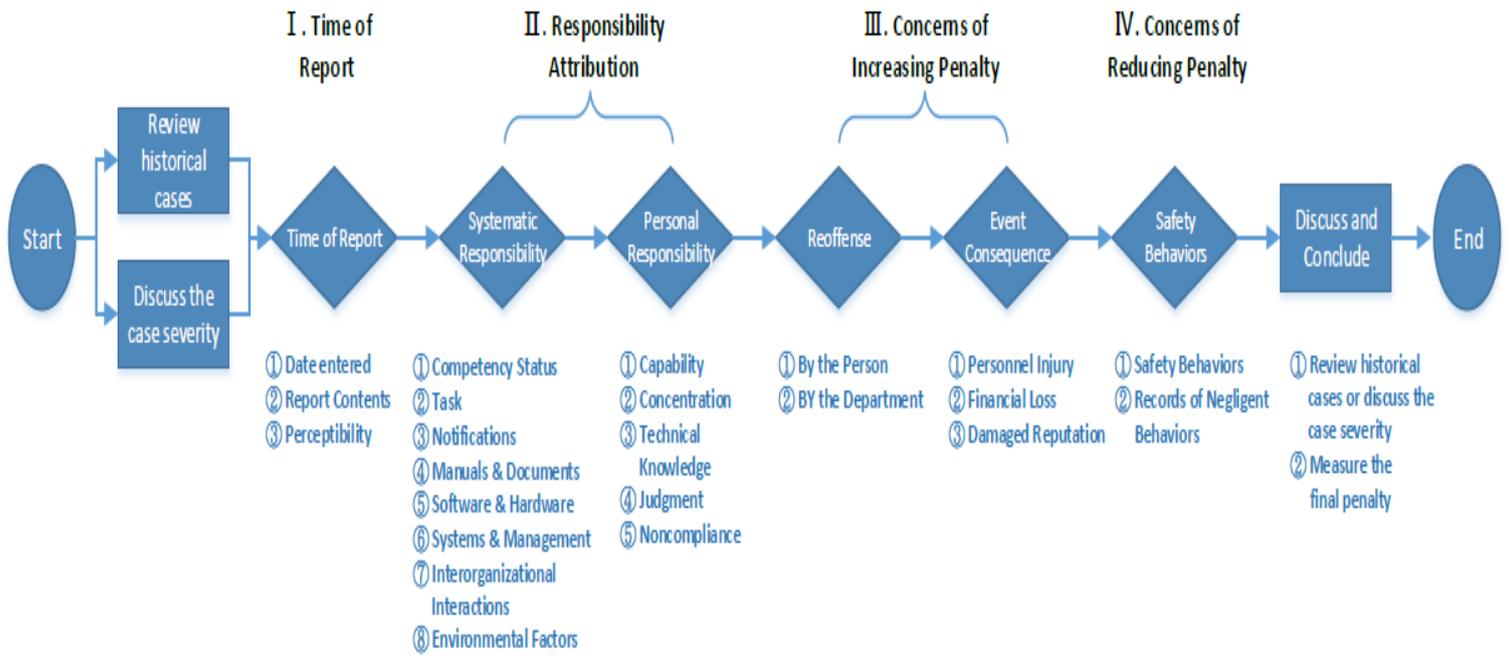
Challenge the organization facing now is staff lack of willingness to participate and report, the reason behind it can be many, but one of them is the fear of blame and punishment. Based on past experience, many staff from shop floor has some misunderstanding about management expects perfect performance from them, and any recommendation or findings made by authority or auditors are to be seen as a failure, and the management will seek for disciplinary action. This is why Just Culture is important, by definition, in Just Culture, errors and unsafe acts will not be punished if the error was unintentional. However, those who act recklessly or take deliberate and unjustifiable risks will still be subject to disciplinary action. In other words, staff can feel they will be treated fairly no matter what have happened. The fairness will encourage staff be more willingly to report hazards and safety concerns they have noticed, because in bottom of their hearts, they understand it's the right thing to do, they just need to overcome the fear and feel safe to do so, therefore, Just Culture is the premise for successful Reporting Culture.

If staff can not trust the fairness can be built, then the mentality of “I don't want to be a snitch, I only need to mind my own business” or “I don't want to cause any trouble” will not be changed. Staff will just turn a blind eye on everything to avoid any inconvenience that will cause them. It is the management's responsibility to set up the pathway for such trust between staff and management because it is the management who has resources to do so. Only after the foundation of the trust is laid, everything else after has the chance to build up.

By using Reason's Just Culture Culpability Chart as an aid to determine the level of acceptance for the error and make suggestion for the consequences the staff should be facing has been proven an effective and acceptable method for both staff and management. China Airlines has also developed its own Just Culture Decision Aid (JCDA) to help management to decide appropriate disciplinary action, there are 4 areas in JCDA need to consider before making decision and in each area, and there are several factors to help evaluation in each area. By using Reason's Just Culture Culpability Chart and JCDA, the level of acceptance is clear for both management and staff, which means there is no room for manipulation for intentional punishment. After successfully establishing the Just Culture and the system starts to be trusted by the staff, the environment and atmosphere in the organization are cultivated for Reporting Culture.



Reason's Just Culture Culpability Chart



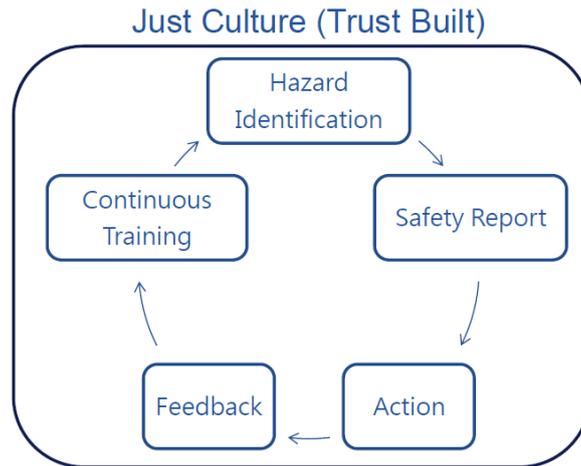
CAL Just Culture Decision Aid (JCDA)

Just Culture is part of the Safety Culture, and Just culture is not a binary concept, it's not that you have it or you don't have it, it is a maturity concept, it will take time and efforts to cultivate it, and

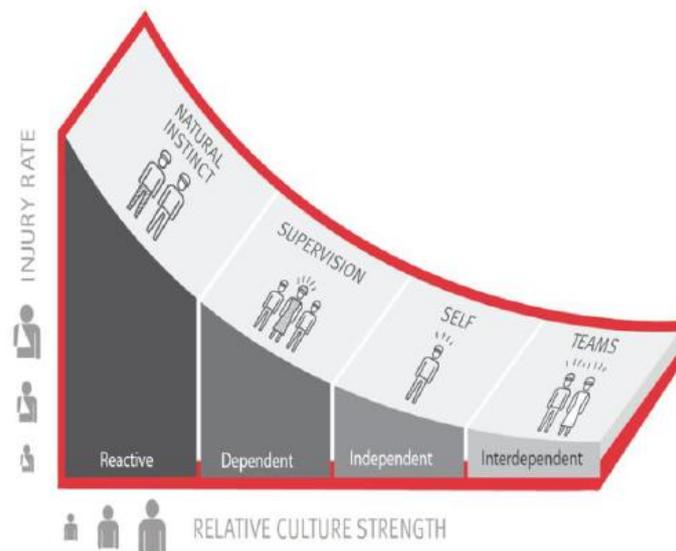
the development of Safety Culture needs the efforts from both the management and the staff, for staff to understand Safety Culture, resources need to be provided by the organization, staff won't all the sudden understand what the safety culture is and what need to do in order to achieve it, therefore, training plays a major role in here. However, imagine a big organization like China Airlines Engineering and Maintenance Organization, if 10 hours of annual training provided to 2000+ employee, with USD 50 man-hour rate, it is more than 1 million US dollars of revenue lost if those time is spent on production, so the management has to be fine with this kind of investment spend on its employee. The key word here is "Investment", it is expensive enough to maintain an aircraft with its routine checks, and it will cost a lot more for unanticipated incident, such as GDIs. It is better for the organization to invest the money and time on its staff to do things correctly in the first place, avoid being penny wise and pound foolish. Also, in every organization, there is certainly some conflicts between management and staff because of different perspective, staff will not agree every decision that management made, but, prejudice need to be put away by staff, staff need to believe there is no hidden agenda to undermine the staff by the management to promote Safety Culture, and have an open mind learning the new concept.

In every organization, there will be staff who in personality are more active than others, this type of people likes to share their thoughts, their ideas and more willing to participate in events, they usually are the main contributors to the safety reports, but on the other hand, there are also some staff who are a bit shy, just quietly do their jobs and keep everything to themselves, how to encourage this type of staff to participate is important. In China Airlines, awards are given to staff for good safety report to encourage more participation and to show the good faith of the organization.

Just Culture is important in the organization because it is an effective tool to build up the trust between management and staff, and with such trust, staff is encouraged to report the hazards they have noticed. Therefore, under the influence of Just Culture, staff will feel comfortable to identify the hazards and report them, the organization will act on those hazards and feedback the staff accordingly, continuous training based on past cases will also provide by the organization, with this positive continuous circle of flow for improvement, safety issues will be lowered and prevented.

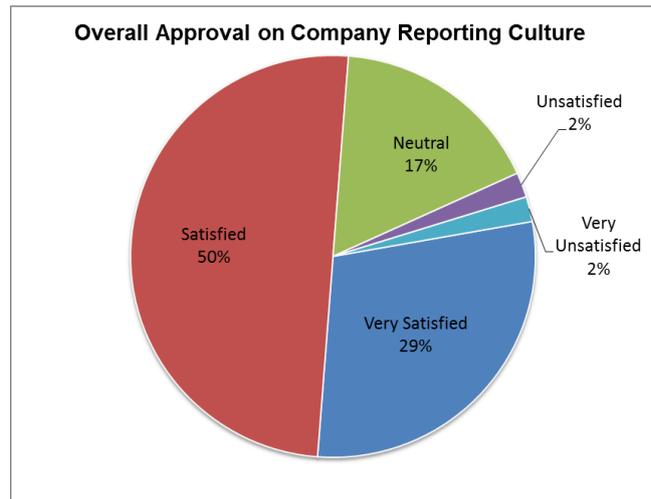


With years of training and promotion about Safety Culture, China Airlines took a survey in 2017, 2602 employee took the survey, and the result showed about 90% of these staff has positive opinion about the safety culture in the organization, and in more detailed analysis of this survey suggests China Airlines is in the early independence stage of safety culture in the DuPont Bradley Curve, what does it mean? It means staff starts to take responsibility and believe they can make a difference with their actions. They now think their actions DO matter.



**The DuPont Bradley Curve**

The evidence of China Airlines is in the independence stage of safety culture also reflects on the number of safety reports collects over the years, the number of safety reports from China Airlines Engineering and Maintenance Organization is gradually increasing, from 377 reports in 2015 to 519 reports in 2018, it shows staff is becoming more aware about their surroundings and more willingly to report the hazards they have noticed. In other words, Reporting Culture is starting to grow among the staff. The contents of the reports are not necessarily all about aircraft maintenance, but also covering on ground handling and equipment as well.



Another survey took in 2018 can also explain the reason for increasing number of safety reports, about 80% of the staff has positive opinion about the Reporting Culture. This indicates that staff approves and feel satisfied about the action and feedback done by the organization to the safety reports they submitted.

Here are a few examples to show staff starts to be more aware of their surroundings and report on the safety concerns they noticed:

Case 1:

Ground power supply control panel box only has 5-10 cm clearance to A350 drain pipe on certain parking bay, increase of load on aircraft could further reduce the clearance and possibly damage the aircraft. After the report is submitted, related department finds the most feasible and suitable solution is to lower the control panel box in order to increase the clearance and neutralize the hazard.



Case 2:

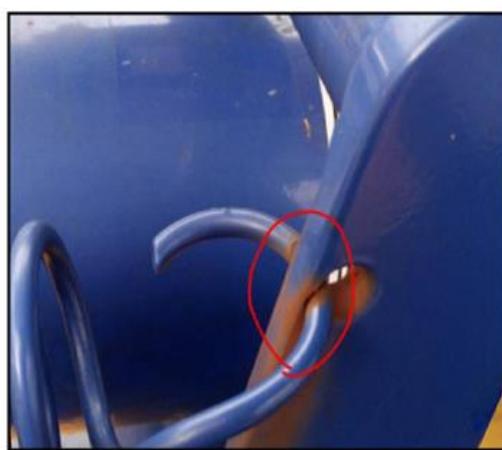
Cargo safety net was incorrectly attached on handle in the cargo compartment by ground handling agent, there are many control handles, or other parts could come in handy and be used to attach safety net, but it also might damage these aircraft parts or trigger unintentional actions of aircraft

components. After the report is submitted, ground handling agents were trained again and make sure proper way of operation is understood by them.



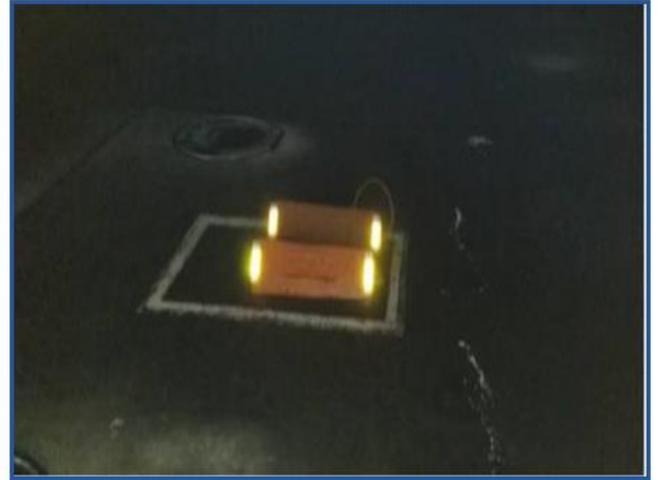
Case 3:

During ground operation, staff noticed that the locking spring hole of the tow bar has the trend to become larger due to the normal wear, the spring could snap out and cause damage to personnel and aircraft if it is left unattended. After the safety report is submitted, a full scale inspection on every tow bar is conducted, and two more tow bar with similar condition were found and repaired accordingly.



#### Case 4:

Due to the appearance of the wheel chock, in low visibility environment, vehicles or personnel could run over or trip over the chock by accident. After the report is submitted, reflectors are added to the chocks to improve its visibility.



The reason these 4 cases are used as examples is because we can tell these hazards have been around for a while, it is either staff did not aware of them, or staff is not willing to report. Either way, these hazards are now been recognized and reported by staff which is the evidence that staff safety awareness is increasing and becomes more active to participate.

Part of the Safety Management System (SMS) is to establish an effective safety reporting system, the main objective of the reporting system is to encourage staff to report unattended hazards or safety concerns that might cause accidents. The success of reporting system is depending on whether staff trusts the system or not. The statistics has shown that promoting just culture can be an effective way for staff to trust the system, and further increases their awareness about the surroundings and their willingness to report the unsafe issues.

Potential safety issues can be prevented with increasing of Safety Awareness after the foundation of trust is laid in the organization with implementation of Just Culture.