LEADING INDICATORS:
The Tenerife Tragedy

This easy-to-use Leader's Guide is provided to assist in conducting a successful presentation. Featured are:

INTRODUCTION: A brief description of the program and the subject that it addresses.

PROGRAM OUTLINE: Summarizes the program content. If the program outline is discussed before the video is presented, the entire program will be more meaningful and successful.

PREPARING FOR AND CONDUCTING THE PRESENTATION: These sections will help you set up the training environment, help you relate the program to site-specific incidents, and provide program objectives for focusing your presentation.

REVIEW QUESTIONS AND ANSWERS: Questions may be copied and given to participants to document how well they understood the information that was presented. Answers to the review questions are provided separately.

INTRODUCTION

The worst aviation accident in history occurred in 1977 when two 747 jets collided on the island of Tenerife, killing 583 people. Just like hazardous situations that lead to injuries in the workplace, there were several "leading indicators" or warning signs preceding the collision that warned of impending danger. In this presentation, fighter pilot and safety speaker Jeff "Odie" Espenship discusses the three leading indicators that led to this tragedy and encourages viewers to slow down, re-plan and refocus when these warnings appear in our workplaces. Also included is an interview with Bob Bragg, the only surviving crew member of the Pan Am 747 involved in the Tenerife disaster.

Topics include addressing changes in work activity, how dangerous it is to not recognize hazards associated with changes in work activity, what can happen when we allow ourselves to succumb to personal pressure and the consequences of failing to listen when others have the courage to speak up.

PROGRAM OUTLINE

THREE LEADING INDICATORS THAT LED TO THE TENERIFE TRAGEDY

- Odie opens the program by explaining what happened that day on Tenerife and what three leading indicators warned of potential danger.

- The worst aviation accident in history occurred back in 1977 on the island of Tenerife off the northwest coast of Africa.

- Two 747 jumbo jets collided when one was attempting to take off while the other was still on the runway; 583 people needlessly lost their lives.

- The leading indicators "popped up like road signs" warning of potential danger.

- The first one was a change in work activity or a deviation from the original plan.

- The second one was not recognizing the hazards or threats associated with the change.

- Lastly, there was a leader who failed to listen when others spoke up.

- The mishap pilots in this event failed to heed these three all-too-common leading indicators and it proved to be a fatal combination for 583 people.

BOB DESCRIBES THE SCENE

• Bob Bragg is the only surviving crew member of the Pan Am 747 involved in the 1977 disaster. He next describes what he witnessed that day.

• "He hit us and I didn't even think he had done us any damage. It was just a very short, just a very quick "boomp" and that was it," begins Bob. "The first thing I noticed were all the windows in the cockpit were gone."

• "Then I looked to the right and the right wing was on fire; I looked back to the left, the left wing was on fire," he continues, "and I looked back directly back of the cockpit and where the upstairs lounge had been located, we had 28 passengers up there. The lounge and the 28 people were missing; they were gone, gone."

• "It was like somebody had taken a big knife and sliced the entire top of the airplane off. I could see all the way to the tail of the airplane; and that's when I realized what damage he had done," Bob concludes.

A CHANGE IN WORK ACTIVITY OR DEVIATION FROM THE ORIGINAL JOB:

The Place

• "Now changes in work activity are a fact of work life. I mean we have to be flexible to change in order for us to be effective in our jobs, but when the challenge of change knocks on your door, they usually come in three forms: the place, the plan, the people," says Odie.

• "The place changed for our mishap KLM crew as they were at a strange airfield—a place they had never been before," he adds. "They were busy sorting out the airfield diagram, how they were going to taxi and what departure procedures they needed to use to get them safely back off the ground."

• "Can you think of times in your work where you've been thrust into a strange work environment? Do you mentally and visually prepare yourself and your teammates for the different surroundings?" Odie asks.

• "Utility line crews that are called to work on storm teams actually do this very, very well," he notes. "The nature of their work puts them in completely unfamiliar territory as they restore power in states or counties whose power lines and systems are uniquely different than what they are used to back home."

• "Yet for the most part, power company storm teams working in different places have the lowest injury-accident rate per work hour because they take the time to recognize, communicate, and mitigate the "kill me" items that are all around. So beware! When the place changes, prepare yourself and your team to properly handle the place you are working," says Odie.

The Plan

• "The second change in work for the mishap crew at Tenerife was the plan. Everyone had to re-plan, rethink and refocus in order to get back on track," explains Odie. "Passengers needed to make connections; pilots were quickly approaching their crew duty day limit."

• "Think about how a change in plans in your line of work changes the dynamics of the job. If you are in manufacturing, for example, the customer may change the work order and you have to stop the current process and retool the machinery," he continues.

• "If you are in construction, or if you do other types of outside work, bad weather may come in and hamper the project you are working on. That may force a change in plans," Odie adds.

• "Another example, you may be coming back to rejoin a job after lunch, or maybe you're coming back after an extended break, or after vacation and the plan as you remembered it has changed," he says. "You should never assume things remain the same as you left them."

• "Any time a plan changes, stop the work, gather your people and hold a tailgate meeting. Be sure the people involved understand, not only the new plan, but also the work procedures and also the hazards associated with the new plan," Odie concludes.

The People

• "That leads me to the final change our mishap 747 crew faced: the people," says Odie. "The people at Tenerife never planned or expected such a situation at their normally sleepy, little airport."

• He adds, "I think the biggest threat for the people involved was the language barrier. The official language of international aviation, or any aviation around the world, is English, but for the people involved, the controllers and the pilots, English was not their first language; it was not their native tongue."

• "Today, many of us work in multicultural, multilingual work environments and English is not the first language. So, crew leaders, shop foremen, supervisors, workmates, take the time to clearly communicate to your people a high level of understanding," Odie says.

CROWDED RAMP FORCES PLANES TO WAIT

• It began with an unplanned diversion which crowded the ramp at this normally quiet airfield with at least five large passenger jets. There was only one runway and one parallel taxiway.

• "And the captain asked, Vic Grubbs, our captain, asked the engineer, George Warns and myself to go out and measure the distance between the KLM left wing and our airplane's right wing to see if we had enough clearance to get around him," says Bob. "We found that we were 12 feet too short to get around the KLM airplane, so we had to wait."

NOT RECOGIZING HAZARDS ASSOCIATED WITH CHANGE IN WORK ACTIVITY

• "That brings me to our second leading indicator, our second warning sign; and that is, not recognizing the hazards and gotchas associated with the change in work activity," Odie says.

• "Many of you work with heavy equipment, others of you deal with electricity, some of you work around fast-moving machinery with spinning parts that won't stop for a leg or an arm," he notes. "When it comes to hazards, you keep yourself and others safe by actively doing these four things: recognize, communicate, mitigate, eliminate."

• "Let me say it again, when it comes to hazards, the 'kill me, hurt me' items, you keep yourself safe and others safe when you can effectively recognize the hazard, then communicate the hazard and then after that, either mitigate or completely eliminate the hazard through proper PPE, our procedures, our policies, technology, or any other means at your disposal," stresses Odie.

KLM CAPTAIN GETS INTO A HURRY

• When the diverted jets were able to leave after a delay of several hours, both the KLM and Pan Am 747s were told to taxi down the runway. KLM was to turn around at the end and Pan Am was to exit at one of the left turn offs, but the plan was complicated by the unfamiliar location, increasingly bad fog and miscommunication between the controller and pilots.

• "The situation was the first officer on the KLM airplane, his copilot, was fairly new on the airplane, he only had 50 hours total time on the 747," says Bob.

• "He had also been checked out by the captain he was flying with, and I'm sure the copilot was kind of in awe of the captain, because the captain, Captain Van Zanten was a public relations rep for the company," he continues.

• "His picture was used throughout the KLM publications, he was in charge of their training department, he was a check pilot, and at that time the cockpit resource management, which is commonly referred to as CRM, wasn't as evident as it is now," Bob adds.

• “I think if it would have been, it would’ve probably helped, because the captain would’ve probably paid more attention to his first officer and his engineer,” he says.

• “I think he was trying to do everything he could to get the flight moving since he’d been delayed having to divert into Tenerife like we were,” notes Bob. “So I think his motivation was to get the flight back on schedule and he just got in too big of a hurry.”

• During the takeoff roll, the KLM engineer questioned his pilots whether Pan Am was clear of the runway. The captain said, “Oh yes!” so emphatically that no other questions were raised. So the great lumbering 747 accelerated into the fog and into history as part of the worst aviation accident of all time.

FAILURE TO LISTEN WHEN OTHERS HAVE THE COURAGE TO SPEAK UP

• “A major hazard they failed to recognize and communicate among themselves is more of an emotional one, but we need to be aware of it; and that’s allowing yourself to be pressured by others or put too much personal pressure on yourself to get back on schedule,” says Odie.

• “When the pressure builds we tend to close our ears, close our minds, and not listen when others have something to say,” he continues, “which is the final leading indicator: failure to listen when others have the courage to speak up.”

• The captain of the KLM 747 was cited for being most at fault, not because he lacked skill or competence or job knowledge, but because he failed to listen when others tried to speak up, according to Odie.

• “So any time you’re out there working, and you see those three sign posts, those three leading indicators that we talked about, that’s change in work activity, then failing to recognize the hazards associated with the change, and then allowing the pressure to build up, and you don’t listen to others when they speak up, that’s what I want you to be cognizant of today,” he says.

PASSENGERS JUMP OFF WING & FUEL TANK EXPLODES

• “Everything was going so fast and so quickly, and we still couldn’t believe what had happened,” says Bob. “I don’t think anybody in the cockpit could”.

• “I started to get out of the seat, and I just did what was natural, I put my foot on the side of the cockpit sidewall, and just jumped over,” he continues. “I didn’t even think about how high it was—it being about 40 feet. So I jumped and hit on the grass.”

• “A whole group of our passengers had gotten out of the cabin of the airplane and gotten on the left wing of the airplane, and I started yelling at the people on the left wing to jump off; and when I did yell at them, they did exactly what I said,” Bob says.

• “They were standing there waiting, and when I said jump, they all came right off the wing,” he adds. “Most jumped from the left wing onto the ground and that’s about 25 feet.”

• “Then the center fuel tank exploded, and the airplane which had been at its normal sitting height on its gear, when the center fuel tank exploded, it collapsed onto the ground,” Bob explains.

• “People that lived around the airport had voluntarily, on their own, come out to the scene to help the passengers,” he says, “and then I started seeing them help the passengers any way they could.”

• “I saw one guy carrying a woman, I saw one guy carrying a passenger on his back, getting them away. So that all took place, probably, it seemed like forever, it was probably minutes,” states Bob.

• When KLM management got word of the crash, they tried to contact Captain Van Zanten to be the company spokesman, unaware that on this day the celebrated captain had been immortalized by the tragedy on Tenerife.

SUMMARY

• "Leading indicators are very common. They pop up all the time when we're working like a speed limit sign or icy road ahead sign when you're out there driving," says Odie.

• "You have to heed those warnings and not treat them as a ho-hum, low-risk event as the Tenerife mishap crew did," he continues. "It's better to slow down, re-plan, refocus, and to spend a few seconds of your life than to lose your life in a few seconds."

• "When you turn this DVD off, take the time to talk among yourselves or work with your facilitator if you have one today, and apply what we've learned today to your workplace specifically," Odie concludes.

PREPARE FOR THE SAFETY MEETING
Review each section of this Leader's Guide as well as the video. Here are a few suggestions for using the program:

Make everyone aware of the importance the company places on health and safety and how each person must be an active member of the safety team.

Introduce the program. Play it without interruption. Review the program content by presenting the information in the program outline.

Copy the review questions included in this Leader's Guide and ask each participant to complete them.

Make an attendance record and have each participant sign the form. Maintain the attendance record and each participant's test paper as written documentation of the training performed.

Here are some suggestions for preparing your video equipment and the room or area you use:

Check the room or area for quietness, adequate ventilation and temperature, lighting and unobstructed access.

Check the seating arrangement and the audiovisual equipment to ensure that all participants will be able to see and hear the program.

CONDUCTING THE PRESENTATION
Begin the meeting by welcoming the participants. Introduce yourself and give each person the opportunity to become acquainted if there are new people joining the training session.

Explain that the primary purpose of the program is to discuss the three leading indicators that led to the Tenerife tragedy and the importance of slowing down, re-planning and refocusing when these warnings appear in the workplace.

Introduce the program. Play it without interruption. Review the program content by presenting the information in the program outline.

Lead discussions about job tasks at your facility in which the three leading indicators discussed in the program could warn employees of potential danger.

After watching the program, the viewer will be able to explain the following:

- How changes in the place, plan and people of work activity can affect our ability to perform job tasks safely;
- Why it is imperative that we recognize changes in work activity;
- How pressure to get a job done in a hurry can have adverse effects;
- Why we need to listen to others when they speak up about a safety issue.

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REVIEW QUIZ

Name_____Date_____

The following questions are provided to check how well you understand the information presented during this program.

1. The Tenerife tragedy is the deadliest aviation accident in history.

a. true
b. false

2. What was the first thing Bob Bragg noticed after his aircraft was hit by the KLM plane?

a. the left wing on fire
b. people standing on the right wing
c. all the windows in the cockpit were gone

3. According to Odie, power company storm teams working in different places have the highest injury and accident rates per hour.

a. true
b. false

4. When returning to your job after an extended break or vacation, you should never assume things remain the same as you left them.

a. true
b. false

5. What does Odie think was the biggest threat for the people at the Tenerife airport as the work activity changed?

a. the airport personnel's incompetence
b. the language barrier between the KLM crew and airport personnel
c. bad weather on the island

6. The Pan Am plane had to wait to take off because it there was not enough clearance to get around the KLM plane.

a. true
b. false

7. Captain Van Zanten was also a _____ for KLM Airlines.

a. public relations representative
b. safety manager
c. maintenance technician

8. The captain of the KLM 747 was cited for being most at fault for the accident because he lacked skill, competence and job knowledge.

a. true
b. false

9. Passengers were jumping from a height of _____ feet from the wing of the Pam Am plane.

a. 15
b. 25
c. 40

ANSWERS TO THE REVIEW QUESTIONS

1. a
2. c
3. b
4. a
5. b
6. a
7. a
8. b
9. b