

## LINE-ORIENTED FLIGHT TRAINING--NORTHWEST AIRLINES

Captain H. T. Nunn

In the world of aviation an apparent contradiction exists. While every flight would seem to harbor the possibility of a new experience, it does not take long to find someone else who can tell a similar story. During the Kitty Hawk 75th anniversary celebration someone postulated that the reason for the short flight of the Wright Brothers was an encounter with unforecasted low level wind shear. Whether true or not, the moral of that statement still stands. Very few experiences are new.

Historically, pilots have recognized the value of lessons learned through experience and have actively sought to share their experiences with others. Through formal reports, classroom presentation and informal conversation (otherwise known as hangar flying), aviators have attempted to share the benefits of "lessons learned through experience." Through the years, flight training has been designed to provide for safe flight by giving pilots an opportunity to develop necessary flying skills and gain information through exposure to potential hazards. Before the existence of flight simulators, when actual aircraft flying was required, the task was somewhat difficult. Safety provisions on training flights were mandatory. Obviously a check pilot had to occupy a pilot seat. Certain maneuvers could not be practiced to a realistic conclusion. Complex real world incidents could not be entirely duplicated. Verbal or written communication remained the only vehicle by which to share experiences.

With the advent of flight simulators, the capability to realistically duplicate inflight problems became possible. However, progress in this direction was slow. Maneuvers, originally designed to satisfy the safety requirements of actual aircraft flight training, were simply transferred to the simulator. In order to design significant improvements in flight crew training, regulatory change would be required.

In mid-1974, the flight training staff at Northwest Airlines began internal conversations exploring avenues of a possible correction for this problem. Later that year we initiated preliminary conversations with the FAA regarding necessary regulatory change for flight simulator training programs. We were seeking approval to create simulator training programs closely related to the actual line environment with total crew participation in real world incident experiences. The FAA responded in a most positive fashion. On June 10, 1975, Northwest Airlines made a formal application for an exemption from certain regulations which stereotyped simulator flight

training. On February 5, 1976, we were granted that exemption by the FAA with an implementation date for the program of July 1, 1976. This allowed approximately five months for Northwest Airlines to develop a program around the concept outlined in the original request.

We selected six of our most experienced instructors; one Captain and one Second Officer from each of three aircraft types. Taking a page from Lockheed's book, we created an area known as "the skunk works." We cloistered the six instructors for a period of three months to ensure their full attention to this project. Their first duty was to redefine and refine the program objectives. Methods and approaches were discussed. One guideline given to these gentlemen was to throw away the rule book and approach the exemption program using their extensive line experience as the primary influence. As a supplement, active participation by our line pilots was encouraged through both written and oral communication.

After initial scenarios were completed, instructor personnel flew the scenarios in our simulators. Further refinement took place at that time. Then line pilot volunteers entered the program and for the first time, sampled the scenarios. After final refinement, the FAA sent local ACI's to fly the finished products. We met our implementation date of July 1, 1976, and from that date forward, instructor and pilot feedback, as well as comments from the FAA, gave us the indicator we had all been waiting for--in fact we did have a most significant improvement to simulator flight training.

The regulation change and accompanying advisory circular are now history. Many airlines have chosen to develop LOFT programs and have experienced success. Today, however, there is not total agreement on all of the principles or the conduct of LOFT. Therefore, the need for this conference. I would like to present, in rather direct fashion, what we at Northwest Airlines Flight Training regard as our position on LOFT relative to certain points in the outline for this conference.

#### Definition and Characteristics of LOFT

LOFT is a line environment flight training program with total crew participation in real world incident experiences with a major thrust toward resource management. Recognition and proper use of available resources, on the part of each crew member, is a new subject for simulator training. Judicious care is required to keep that primary goal untarnished.

LOFT is not full-mission simulation. LOFT utilizes full-mission simulation to create a real-world environment but full mission-simulation has many uses beyond original LOFT concepts.

Full-mission simulation may be used as a vehicle for check-rides, navigation training, specific emergency procedures training, experimental evaluations and other purposes. The primary thrust of LOFT is not specific procedure training and is certainly not intended for flight checking. A proper distinction between any type of full-mission simulation and LOFT must be maintained.

LOFT is learning through involvement in simulated real world incident experiences. It is in a sense "case book" education as opposed to "batting practice." No one could properly argue that manual flying skills are not important; they certainly are. But practically the total thrust of past simulator training has been dedicated to precision batting practice. A proper division of time needs to be given both areas without inordinate emphasis on either one.

In LOFT case-book type education, lessons are learned through personal involvement. The old cliché, "experience is the best teacher," has definitely proven true. Comments from our crews indicate more has been learned and retained longer through LOFT involvement.

Real-world problems must be provided. This is a basic departure from aircraft systems-oriented failures. A hardware failure may certainly be involved but it is not necessarily the "Star." Accident reports indicate many incidents result not from a single catastrophic event, but rather culminate from an interconnected series of not so apparent elements. The proverbial primrose path can be created from any number of diverse sources. To set up the problem situation, the LOFT case book should use reasonable real-world events to the extent possible.

Crew interaction is an essential feature of LOFT. Past training practices tended to isolate crew members requiring them to operate as a "one man band." Contrary-wise, LOFT stresses the importance of operating the aircraft utilizing the coordinated efforts of all crew members. Complex operational procedures mandate effective crew interaction. By confronting the crew with situations requiring a high degree of coordination in order to reach a successful conclusion, LOFT forces them to utilize interactive skills or observe the consequences. As one of our pilots commented, "it is interesting to see a coordinated crew lose its coordination." A lesson was learned!

System interaction in real-time is also an integral concept of LOFT. Use of total system elements requires a high degree of simulator sophistication and instructor expertise. The higher the degree of realism, consistent with cost, the better. ATC, aircraft sound, company radio or data link, maintenance control,

flight attendant problems, etc., all contribute as elements of the primrose path. Placed in the context of real-time, the crew must exercise management skills and utilize available resources. These skills cannot be effectively honed in a sterile atmosphere.

LOFT, properly practiced, should emphasize the importance of positive flight management. Events outside the control of the crew are pre-programmed in the LOFT scenario and will occur regardless of crew action. Due to this fact, inappropriate action or indecision may quickly compound a simple problem into a much more serious one. On the other hand, properly managed, no compounding will result.

One absolutely essential concept for LOFT is protection of the training environment. The training environment is essential so that pilots feel free of checking constraints and stereotypes. We are human and subject to error. In LOFT, mistakes will be made. According to Dr. Lauber, "to some extent, the success and efficacy of the LOFT session depends upon the number of errors made; up to a point, the more the better." Recognizing and observing our own errors brings insight into our own performance. To those who are hung up on the concept of checking and cannot be satisfied without it, LOFT does have an element of checking--"self checking!" We do learn from our own mistakes and "lessons learned" is our goal. The response data from our exemption program graphically illustrates that people learn vividly from their own mistakes. The key question for an instructor is not what errors were made but do the pilots recognize and understand why the errors were made? How aware are they of critical events and do they have insight into their own performance?

#### Construction and Conduct of Scenarios

The obvious key to successful scenarios is the personnel assigned to the development project. Our approach mandates that only pilots with current line experience be involved in LOFT preparation and development. With proper guidelines and adequate time for preparation, our flight instructors have produced outstanding results. Following are some of the guidelines provided our instructors:

1. Problems must be realistic or actual events.
2. There is no requirement for any particular maneuver or approach; so as to practice flexibility according to real world parameters.
3. An early problem can set the stage for a later major event (e.g., early engine flameout with

restart capability; later that same engine could develop a fire).

4. Remember the real world; flying can be boring. Do not "overfill." Leave time for a lull. This is necessary both for the illusion of realism and training effect.
5. All simulator or system elements may be manipulated to achieve the desired result or to cover simulator deficiencies (e.g., dispatch release, minimum equipment list, weather, ATC, cabin problems, etc.).
6. It is very important that scenarios not be overly complex. The objective is to make the scenario sufficiently difficult so the crews will find them challenging, but not so difficult as to be impossible.
7. Provide a standard instructor briefing. Remember the briefing establishes an atmosphere and can mean success or failure for LOFT learning. A good briefing can set the stage for a successful debriefing.
8. Remember, there is not always a solution for every problem. Use an actual event or create realistic problems for which there is no procedure or solution (e.g., a stuck landing gear causing a gear-up landing; this type of element should not be used routinely in every scenario).
9. Stretch your creativity to produce realism. Coordinate with simulator maintenance on possibilities (e.g., we used the motion platform bump when initialized to simulate push back). Now through programming, the simulator will produce fully simulated push back motion including visual. Such attention to seemingly small details will greatly enhance the overall impression of realism.
10. Follow all material as presented in Advisory Circular 120-35.

#### Debriefing and Assessment Standards

The debriefing session, following a LOFT flight, should be a continuation of the learning experience. With the training atmosphere still preserved, the debriefing provides each crew

member with a forum to verbalize their self-evaluation. This validates the depth of learning from the events just experienced. It is of paramount importance, therefore, that the instructor permit the participants to exhaust their evaluation before proceeding with the instructor-noted items. In a perfect situation, the instructor should be left with zero items not already mentioned. Otherwise, the instructor should cover unmentioned items with tact and a positive attitude.

During the LOFT flight, instructors should note observations of the following key items for the debriefing session:

1. Resource Management
2. Crew Coordination
3. Crew Management
4. Timely Decision Making
5. Use of Specific Procedures
6. Problem Solving Process

After all debriefing items have been covered, the crew should be excused. If any crew members have exhibited the need for further training, they should be called aside privately and the matter discussed. Perhaps this single event calls for the greatest tact on the part of the instructor. The crew members' performance did not constitute a failure, nor place their job in jeopardy. The "train to proficiency" atmosphere must be preserved for positive training to result.

In October, 1976, Mr. Webster B. Todd, Jr., then Chairman of the NTSB, spoke before the Flight Safety Foundation. In that speech, Mr. Todd, speaking in the context of Appendix F Check/Training, stated that it is:

"A process based on checkitis--a process based almost on the presumption of incompetence of the pilot. Every six months, either the air carrier inspector or the instructor pilot that is checking that airman is looking at him from a proficiency basis .... he is totally programmed from the time he gets in that simulator until the time he gets out of it. He enters that simulator, whether he likes to admit it or not, whether the company likes to admit it or not, whether the FAA likes to admit it or not, he enters that simulator with a feeling in the back of his head that somebody is trying to take his certificate away from him--to remove his livelihood. I submit that that can only lead to a basically negative training program."

We certainly concur with Mr. Todd. Regardless of the name it was given, past simulator flight training was almost totally oriented around a checking atmosphere.

In truth, LOFT represents significant progress over past simulator flight training. The broad base of pilot acceptance and enthusiasm is evidence of positive results. The very foundation of this program is maintaining the "train to proficiency" posture. In this framework we look forward to future progress and improvement.

#### Discussion

CAPTAIN FRINK: Tom, first I want to express on my own behalf, and I am sure on behalf of a lot of people here in the training business of the airline industry, a tremendous feeling of indebtedness to you and your pioneering efforts in this area and the wonderful work that you have done. You have set a tremendous example for all of us, and we are going to do our best to emulate that example.

I would like to ask you a couple of questions about how you have come along. One of them, did you, or do you have the same total amount of simulator hours in training now as you had prior to instituting LOFT?

CAPTAIN NUNN: Yes, Al, we do. This causes us a certain amount of concern because LOFT is not a total training concept. It can't be. I think we alluded to the batting practice versus the casebook training type of education. We need a balance between the two, and with the time we have now allotted, if we spend the full four hours every year for first officers and flight engineer/second officers in LOFT, where are they going to get their batting practice? We have not gone far enough with LOFT for this to be a critical problem, but I foresee one in the future. I think we need to address that as a very serious issue here-- the establishment of a balance between true training and batting practice, but we really have not had the latter either. It has been proficiency checking. I do not care whether we call it proficiency training, or proficiency check, or training in lieu of a check. It makes no difference--in reality, it has still been proficiency checking. We need true training, not an appendix of maneuvers, but many of the things that have been suggested: "the black-hole approach, the slippery runway conditions under cross-wind, etc." We really need these in training. Likewise, I think we need LOFT and a balance between the two, but we have not come up with a solution yet.

CAPTAIN FRINK: I assume that all of your crews, regardless of whether this is a short-range or long-range operation, are

involved in LOFT. In other words, are you just as apt to have your 747 crews in LOFT as your short-range people?

CAPTAIN NUNN: That will be true, yes. There was a period of time when we had to give LOFT up because of a very dramatic vertical movement in our crew structure. We had a down-turn and then an up-turn where they were going through transition, upgrade, downgrade, requalification, and so forth. That precluded the use of LOFT. However, in a static situation, that would be our standard practice.

CAPTAIN FRINK: How often have you determined that additional training is necessary after one of the LOFT sessions?

CAPTAIN NUNN: I don't have the figures, but it would probably be less than two or three percent of the cases.

CAPTAIN FRINK: Has there been a reaction to that on the part of your pilots? When you give them additional training you have not, in effect, been giving them "true training." Haven't you, in effect, been checking them?

CAPTAIN NUNN: Our pilot reaction has been very positive. The additional training was welcomed. It was perceived as being useful and was conducted in such a way that we prevented what I consider to be a key issue. That issue is the prevention, at any cost, of the embarrassment of an individual crew member. We dare not embarrass professionals, and our pilots and flight engineers are professionals.

CAPTAIN FRINK: I know, that because you bring your captains in twice a year and the first officers and engineers in once a year, you obviously cannot give a LOFT session in all instances.

CAPTAIN NUNN: That is correct.

CAPTAIN FRINK: Do you find resentment on the part of those who come in for recurrent training and find they are not getting LOFT?

CAPTAIN NUNN: Yes. They feel as though, in a sense, they have been cheated.

CAPTAIN FRINK: Can you give us an idea of what this program might have cost you? Do you have a requirement for full crew? If you have scheduled a full crew and not achieved it for the session, do you bring pilots in on extra time? Have you any idea, or have you attempted to put a cost figure on LOFT?

CAPTAIN NUNN: Al, if I answer that question, I had better not go home.



CAPTAIN FRINK: Okay, I think I will listen for awhile, thanks Tom.

CAPTAIN MICHAELS: I am curious about the amount of acceptance among your line crews of the LOFT program. Was there any significant negative response?

CAPTAIN NUNN: Let me give you an example of what happened at the very outset. We invited ALPA to come in and participate at the beginning of LOFT development. Can I regress for a minute, then I will answer your question?

I do not want this conference to go too far without addressing the question of where the acronym LOFT came from. We called it Coordinated Crew Training (CCT). We had a meeting in Minneapolis at Northwest with Dr. Lauber and several industry representatives. Eastern Airlines had Ed Warden there, and there were many others including the FAA from Washington. Dick Collie was heading up the session, and he did not like CCT. Some of our crews called it "Combat Crew Training." We were trying to develop an acronym and Dick Collie said, "You know, the government likes four-letter acronyms--we can't live with a three-letter acronym." We were scratching our heads, and everyone was trying to come up with something and he kept saying, "Well, it's line-oriented, and it's not checking, it's flight--by golly, we're going to call it line-oriented flight training--what do you think?" It was Dick Collie of the FAA who gave it a title.

But, back to your question. We invited ALPA to come in, and there was a young man from the Training Committee in Seattle who came to me and said, "I want you to know something. I'm opposed to this. We had the same thing in SAC (Strategic Air Command-USAF)." He was referring to SAC's full-mission simulation. He said that it consisted of one emergency piled on top of another and another until the crew broke, that it was negative training, and, "We're opposed to it." He said, "I'm going to do everything I can to kill it." I invited him to participate in one of the scenarios. He said, "You want me to do that, and give me ammunition?" I said, "I want to give you all the ammunition you need if it's wrong, so come on in and participate." He did. At the two-hour break, he came out of the simulator muttering to himself, "My gosh, you know what I did?" He was shaking his head. He went back in, and when he came out at the end of the four hours, sweat was coming all the way down his shirt, from under his armpits, and the brow was wet, as most people's are. He could not quit talking about the mistakes he had made. The first officer was the same way. That young man went away not as an opponent of LOFT, but as a proponent. In fact, he almost took on an evangelistic zeal and saying, "I have

never learned so much. I came in with a negative attitude, and I went away with lessons learned." I think that is perhaps the most dramatic response that we have had, but it is typical. Of all the pilots who have gone through the program, only one or two have been rather lukewarm.

CAPTAIN MICHAELS: One other question Tom. Have you had the program long enough for all of your crews to have had a second experience with it?

CAPTAIN NUNN: A large number, but not necessarily all, and the response has still been the same.

CAPTAIN ATKATZ: Have you been able to document a change in the performance of crew members from one experience to another in terms of resource management?

CAPTAIN NUNN: I don't know that you could say that we had a study that documents it. How can you prove that any training has prevented an incident or an accident? I cannot say that we have.

CAPTAIN ATKATZ: I am not saying that it prevented an incident or an accident. I am saying that in terms of their performance from one LOFT session to the next LOFT session, how did they perform the first one as compared to the second one?

CAPTAIN NUNN: All right. Again, we do not have data formally recorded that can prove it, but we have feedback from instructors which definitely indicates improvement in crew coordination and resource management among those who have undergone their second or third session--we have some who have gone through three LOFT sessions--rather dramatic improvement.

CAPTAIN TRAUB: Tom, you did not say anything about crew composition with LOFT. Do you always have a captain, first officer, and second officer?

CAPTAIN NUNN: Since we operate three-man crew airplanes, yes, and they are line crew members. We feel we cannot introduce instructors in the event someone does not show up. If the instructor knows that a problem is coming, how can he be a member of a problem solving team? He knows what the problem is, and he knows the solution, so he is going to be play acting. He might be a disturbing element even if he did not know what was coming. It violates the validity of the scenario, so to speak. Now if he is an instructor who is not familiar with the scenario and is qualified in a crew member position, I see no reason why they could not take a participant's role.

CAPTAIN ATKATZ: Do you fill in, in any way, if somebody does not show up in some situation?

CAPTAIN NUNN: We will try if we have time to go to crew schedules and get someone off reserve for that particular crew position. If we cannot, then we revert to a standard Appendix F check or training session, as appropriate.

MR. THIELKE: One question is, what do you do in the case of "no-shows" because of the weather, or something such as that? The second question is that you said you do not record the data formally. Do you plan to record data regarding an individual's performance from one LOFT session to the next?

CAPTAIN NUNN: We do not plan to record it on an individual basis. However, we have a debriefing form for our instructors where we do record crew performance on specific procedures. One thing we do want to know--you touched on this earlier--is where is the task loading too heavy, or where do procedures need refinement? We are looking for overall operational improvement using information obtained from LOFT sessions, but with regard to evaluating individual performance, we do not give grades or keep such information as part of their record. Satisfactory completion is noted as part of their record and that is it.

MR. THIELKE: Is that at the end of their program?

CAPTAIN NUNN: Yes, it is.

CAPTAIN SMITH: Have you used the LOFT approach in your initial first officer or captain upgrade programs, and if so, what has been the result of that?

CAPTAIN NUNN: We have not. We have used LOFT only in the context of recurrent training. We have used "capital" LOFT, as Walt said earlier. We have not yet developed lower case or "little" LOFT.

CAPTAIN KARABELLA: I have one more question concerning LOFT that some people have brought up previously and that regards progress or getting ahead. I think most everyone has a certain, what has been alluded to as, two or three percent of problem people, who from one six-month interval to the next do not progress. They go on. In what you have been doing so far, do you have any indication that progress has been made in this two or three percent?

CAPTAIN NUNN: Yes. We all have that two or three percent. LOFT did not create the problem. The proficiency problem existed before they came into LOFT, but what LOFT has done in the evaluation process is to give us a broader view of that crew member's capabilities. We have been able to focus and define in

a much sharper fashion where his problem is. Maybe it was in crew management, or maybe it was in manual flying skills. Maybe he did not even understand command responsibility or authority, or crew management. It has been defined by LOFT. We focused on it, gave him additional training appropriate to his deficiency, and they have not been repeaters. We have not had one single repeater come in after he has had additional training after LOFT.

MR. WARRAS: I have just one comment, Tom, as a follow-up. In the early days of LOFT, I can recall sitting in on a period with a captain, a 727 captain, who did not use his resources properly. His management of the crew was below average. He had a strong copilot during that period, and the copilot took charge during the whole LOFT period, and they came to successful conclusion of the operation. However, after that particular period, the captain remained for additional training. I happened to fly with him in his second LOFT period a year later, and he was a completely changed individual. He was well-versed in aircraft systems and procedures, and so on. He came back that second period, and he really knew what he was doing. He took charge, he took command, and he utilized all his resources.

DR. LAUBER: Thank you very much, Tom.

PANEL DISCUSSION OF THE FRONTIER AIRLINES LOFT PROGRAM

Captain Roy Williams

CAPTAIN ROY WILLIAMS: I certainly cannot add very much to what has been said. I really do not even know how Frontier heard about LOFT, but we did and when the Advisory Circular came out, we went to Northwest Airlines and rode through a few of their scenarios. We adopted their format, at least at that time. With regard to the LOFT program itself, it has been very successful. Our biggest problem has been scheduling. We use LOFT in lieu of a PT (proficiency training), and we always schedule a line first officer and a captain, but sometimes, getting those two together is difficult. However, if the copilot is in for a PC (proficiency check) or a PT and the captain is scheduled for a PT, we will run a LOFT session. That procedure has been approved by our local FAA inspector. Thus, there is the possibility, although it has not happened so far, that a first officer could go two or three years and never have a PC, in theory, and would never be examined on the required Appendix F maneuvers.

Another problem is convincing our crews that the program is intended for training and not checking purposes. Our local FAA says, "Oh, no, no; it's a check-ride as far as we are concerned." We have been arguing the point back and forth. However, at any time, if you bring a crew in, tell them that LOFT is for training purposes only, and then later inform them that their performance has been unsatisfactory; you have thrown the entire program out the window. In a small airline like Frontier, all they have to do is go back to the crew room and thirty minutes later no one is going to accept the program.

We think LOFT is good, and use the program quite a bit. We feel our system is unique in that we write 30 or 40 minute legs into our scenarios, and that works out beautifully. We can pick any trip we want and design the scenario for three hours and twenty minutes which leaves us forty minutes left-- something we feel is important. In that period, we can cover anything that an instructor feels may be a problem. This system creates no embarrassment, and we can return him to the line. We feel that is very important. At this point, I will answer any specific questions.

CAPTAIN HARDY: If you detect a deficiency in one particular crew member, would you train him to proficiency in that 40 minute period or would you bring him back later?

CAPTAIN WILLIAMS: We would try to train him in that 40 minutes.

CAPTAIN HARDY: You would not bring him back later?

CAPTAIN WILLIAMS: Well, it depends on what the problem is. Last week we had one LOFT session where the first officer was unsatisfactory in terms of the conduct of the checklist and other procedural things. In that case, we brought him back into another LOFT session the following day after telling him what his particular problem was. All he had to do was go home, study it a while, and he was fine.

We have found LOFT to be very effective. We use problems that have been identified in line operations, both mechanical types of things as well as decision-making problems.

CAPTAIN TRAUB: Earlier you said the scenarios were 30 or 40 minutes in length. Do you put several of these together?

CAPTAIN WILLIAMS: Oh, I meant the stage length.

CAPTAIN TRAUB: Oh, I see, and you put that whole program together?

CAPTAIN WILLIAMS: Well, we take an actual trip: Denver to Great Falls, through Casper, and on to Billings is a good example. We use the exact trip, the exact times, turnaround times--everything is identical to the actual trip. When the crew arrives, they receive a flight release, a computerized flight plan, and we print weather information for the scenario. It is no different than if he went to the crew room, got his papers, and took the trip. They are exact trips. That is one thing about being a small airline--we cannot really write a scenario that most pilots have not actually flown on the line. That helps a lot.

CAPTAIN STEGER: Did you say your FAA considers LOFT a check ride?

CAPTAIN WILLIAMS: Yes, it is a check, but our FAA considers any time a pilot goes into the simulator with a check airman to be a checking environment, even if it is a practice session.

CAPTAIN STEGER: How do you resolve that? How do you get the pilots to accept, to have the proper attitude toward LOFT with that attitude from the FAA?

CAPTAIN WILLIAMS: Well, we battle a lot-- (laughter) we do not actually tell our pilots that they are being checked. We tell them that LOFT is LOFT, and that there really is no failure, provided they do not completely fall out of their tree--you know, fly the trip upside down or something. Fortunately, the FAA has stayed away from us, for some reason, on LOFT. They do

emphasize the fact that they want people grounded, more or less, just as if they failed a PC or a PT.

MR. HUETTNER: I'm not going to touch any of that, but I do have one question. You mentioned that you were small and that word gets around quickly. How do you keep the crews that have been through the scenarios from informing those that have not, so that it can truly be a LOFT-type training program?

CAPTAIN WILLIAMS: Well, at the moment we have six scenarios. We have only 600 pilots and only about 400 of those are jet-pilots. We do not use the LOFT program for the Convair 580--we do not have a simulator with a visual system for that airplane.

Another aspect is scheduling. We have been using LOFT since early 1979. With captains and first officers scheduled together and the captain being on a PT and not a PC, we still have not gotten through the entire pilot list. To my knowledge, no one has ever repeated the same LOFT scenario. If they discuss scenarios, the chances are that they will not get the same scenario even if they just went to crew room and informed about the whole thing. The odds of another crew doing the same thing are very small within a short time frame.

CAPTAIN ATKATZ: I want to ask Tom a question in reference to his difficulties with the FAA. Have you had any and if so, how have you resolved them?

CAPTAIN NUNN: We have only had difficulties with one or two particular ACI's (Air Carrier Inspectors) who sat in on a LOFT session and said, "That man failed." I take the ACI to the back room and talk to him in a very direct fashion. We pull material out from the approved training program, and we discuss it. He concurs that the man will continue training or that he misunderstood the program, and we have resolved the problem there without it getting to the pilot. It has never affected a pilot, so we have had no problem, really.

CAPTAIN ATKATZ: Well, what is the attitude of the individual?

CAPTAIN NUNN: As far as our principal is concerned, there is a depth of understanding of LOFT. We receive excellent support in that relationship from the FAA.

CAPTAIN WILLIAMS: I would like to make a point in regard to the issue of the scenario contents becoming well-known. As I said, we have six scenarios, and that is a lot of material. We try to keep them confidential, but even if the content got out, no one can possibly know when the faults or systems problems will be introduced. But, if they want to go out and share them, fine. In one sense, that is our goal. When we can get crews talking

about what they did in training, that's just absolutely super, but they are still going to have to solve the problem when they get into the simulator, even if they know what is coming.

We had a guy sneak out a copy of a scenario, and he studied it the night before. He still came out sweating under the armpits. He still made mistakes, some rather dramatic mistakes, and he still learned from the experience. We have found that to be absolutely no problem.

DR. LAUBER: Any more questions for Roy?

UNKNOWN SPEAKER: Again, to respond to Charlie (Huettner), maybe for smaller airlines and possibly as a change in the Advisory Circular; we could start with three scenarios and add one each year. That would allow on-going change in the program. At least it is something for the discussion groups to consider.

DR. LAUBER: You will indeed have that opportunity when we give the working groups their instructions later this afternoon.

CAPTAIN WILLIAMS: John, I would like to say that we change our scenarios every year.

UNKNOWN SPEAKER: All five of them?

CAPTAIN WILLIAMS: All six of them, right. We pick different routes--we may use some of the problems again, but we do change the scenarios, and our approval is based upon that. That is another reason that why the pilots do not get too familiar with them.

CAPTAIN WINTENBURG: I would just like to know, what was your cost factor--not in actual dollars, but compared to what we heard about Northwest's experience?

CAPTAIN WILLIAMS: In developing the LOFT program itself? Well, actually it was dirt cheap because we went to Northwest and sort of copied their program-- (laughter)--right down to the way we wrote our scenarios. In fact, the one they are missing, I have. (laughter)

MR. HUETTNER: I just want to say that as far as the FAA and monitoring of programs are concerned, we look at this as an entirely new program, and we are going to totally rethink the process of recurrent training--something I tried to say at the beginning. As we go through the regulatory effort, there will be a whole new set of guidelines and instructions to our field people in order to help standardize their approach to the monitoring of programs in the field. We expect something similar to the misunderstanding which occurred with the advanced



simulator regulation. We will bring all the principal inspectors together to discuss these types of things once we have decided how it is going to be. I would like everyone here to at least feel unshackled with respect to the development of this program. We will do our utmost to standardize our people in the years ahead.

CAPTAIN WILLIAMS: Let me say one thing. I do not want it to get back to our POI (Principal Operating Inspector) that I was running him down. The FAA has never sat in on a LOFT program and caused one of our pilots to be grounded. The only thing I was referring to was that it would be nice to be able to tell our pilots that this is not a check environment. This is strictly training, and we are not going to fail you, so to speak. What the FAA is really concerned about--and you can't really blame them--is proficiency, but we have a moral obligation. This program is no different than a line-check in a real airplane. If I give a line-check and a pilot is obviously not doing his job, I am going to remove him from the trip. That is what they are concerned with (so are we). But, it certainly helps if you can tell your pilots when they come in for a LOFT that you are not going to fail them--that it's not going to be a black mark on their record. We have to be careful, FAA wants our assurance that we are not going to let an unqualified man fly the line. That is all I was trying to say.

CAPTAIN FRINK: We are going to cover this whole area, the semantics of evaluation, checking versus training, and so forth; in our working group. We are very anxious to get all of this cleared up, so we will be coping with the semantics of this.

DR. LAUBER: Good. Roy, thank you very much.