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**A View from Inside OSD
Donald Latham**

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A View From Inside OSD

Donald C. Latham

Mr. Latham is Assistant Secretary of Defense, C³I. He has also served as Deputy Under Secretary of Defense, C³I, in the Office of the Under Secretary of Defense for Research and Engineering. Before assuming his present responsibilities, he was Division Vice President, Engineering, at RCA Government Systems Division, where he reviewed and coordinated engineering activities in various tactical, strategic, and space systems for the military, NASA, and other government agencies. Mr. Latham is also the author of two books and numerous technical papers, and a contributor to many DOD engineering studies and proposals.

It's very difficult to talk about the C³I area, or even the C³ part of C³I, without straying into classified situations very quickly. So, where it might appear that there are gaps or holes in what we are doing, I would say that's not really the case. We are, in fact, filling up all the holes quite well. In many cases we just can't talk about it. I am going to cover a lot of material, but in some cases I cannot go into much detail.

Let's begin with the long-term trends in national defense, and talk about Defense Guidance, and a little bit on policy as a result of that — policy perspective or what the strategic problem really is. Unfortunately, I can't go into the national intelligence estimates that support all of that because we get into the classification issue. I want to show you what I call the disinvestment problem. There's been a lot of writing recently claiming the Soviets really are not spending all that much, only two percent a year if that is even correct. Well, it's two percent on top of a base that is far higher than ours. I tend not to believe the percentages anyway, but I'll show you how bad it is.

Next, I'm going to touch briefly on two views of the C³ area, the United States' and Soviet's. Here,

unfortunately, I had to leave out significant material because of the classification issue, but there are some very, very interesting things going on that I will mention. Suffice it to say that the Soviets are spending enormous sums of money in the C³I area — and have been for a long time, are paying a great deal of attention to it, and are quite good at it, especially as it ranges from leadership protection and the survival and endurance of the Communist Party, to heavily fortified shelters, to airborne command posts and submarine command posts, and satellites, etc.

There's a long story about our C³I master plan; I will touch on it just once later. I want to talk to you about what we're doing in the strategic C³ area; if you want to talk about tactical or theater areas, we can do that as well. I will give you a rundown of where we're going on various initiatives there. Then I'll talk about our investment story — where we're spending money and how much — and I'll give you my assessment of how we're doing.

First of all, within the long-term trends in national defense, the first and most important thing is that there is continued, enormous Soviet momentum in the technology of weapons development and production. They have a strategic defense program that is

larger and moving at a pace far faster than ours. That has not been very well publicized, unfortunately. But it is true. For example, in high energy lasers, their effort is much bigger than ours, and they are making a major move in space, clearly aiming to put a man in space and keep him there permanently; not just "a" man, but men (and women). So, the Soviet momentum is enormous and their spending on national defense is estimated from a low of 15 percent of their Gross National Product (GNP), to a high of as much as 40 percent, depending on whom you believe and how you calculate their GNP. All I know is what I see coming out the end of their factories.

We are going to have to cope with our own future budget realities — past disinvestment and limited real growth over inflation. Right now there is a heated debate in Congress. I was over at the Senate Armed Services Committee yesterday at 8:10 a.m. pleading my case, as they're marking up our budget at zero, three and four percent. They are going out on the floor with those kind of budget numbers. We're never going to get the 5.9 percent we requested in FY86. Zero, three or four percent is what it looks like; that is real growth over inflation.

We are continuing the strategic modernization program. I see that as a cornerstone of the President's policy. As you know, we had a bitter fight to get the next 21 MXs, and we're going to have a bitter fight to get even just some of the 48. Right now the Senate Armed Services Committee is saying 21, and that's probably the high mark. So, we are going to have a big problem. In the case of C³I, however, we are totally and completely supported.

In the conventional and theater nuclear forces modernization program, we're emphasizing what is known as the interdiction attack effort, which is a conglomeration of many programs. That has about nine billion dollars in it over the five-year defense plan. We are making major efforts to modernize conventional forces as well as strategic in the theater. To give you some feeling for this level of support, 17 percent of this year's defense budget, roughly 15 percent of last year's, went to nuclear forces. The rest was conventional. It is conventional force initiatives that are still overwhelmingly funded and that is where the budget is really going. But if you read the newspapers, it sure doesn't sound that way.

Concerning strategic defense, all you hear about is SDI, or Star Wars, but that is only one component of

the triad of strategic defense initiatives. We are combining air, space, and ballistic missile defenses as an integrated strategic package, and addressing it that way under a program called Strategic Defense Architecture 2000 (SDA2000). General Robert T. Herres, CINC NORAD, has the responsibility for leading that planning effort.*

Finally, long term trends must include arms control. Its impact is still unknown, but it is clearly something that's going to affect where we go and how we get there in the future, depending on the outcome of the Geneva talks.

The strategic problem that we are faced with is then summarized in the new Defense Guidance, for FY 1985 to 1986. It states that since we're committed to a defensive use of power, we are always going to be reacting to what is known as ambiguous warning, or after the enemy has seized the first initiative. Everybody talks about unambiguous warning, but we'll never have such a thing. Either there will be warning indicators on some pending attack that will be ambiguous in the sense that you're really not sure what's going on — so it will be a very difficult problem — or else the enemy will go first with no warning at all. This situation puts a very heavy burden on the C³I system.

Strategic warning is the kind of warning you would hopefully obtain before any weapons are launched. Our guidance therefore is to exploit it whenever it's available, and provide the National Command Authorities (NCA) with a range of options, not just a single option. We're also instructed to react in a timely manner to tactical warning; that is, the warning you have once missiles or other weapons are launched, or a specific event has occurred. And then we have to do something about exploiting the enemy's weakness by counteroffensives, and to do that intelligently requires a C³I system that is as survivable and as enduring as the forces it supports. That's a very major initiative, and a very difficult thing to do under many circumstances.

Defense Guidance summarizes the missions of the strategic forces and the supporting C³I. First, we must be convincingly capable of responding to an enemy's first strike so as to deny him his political and military objectives. And we must bring the con-

*Gen. Herres has subsequently become CINC SPACE as well. See his presentation later in this volume.

flict to an early close. We must support our alliances should deterrence fail, denying victory at any costs, at any level, and terminate on terms favorable to our side. How that can all be accomplished in specific terms is not at all clear. It depends on the circumstances. But in order to terminate hostility you've got to know what's going on, you've got to be able to communicate with your adversary, and so on. We are taking steps to be able to do all that. Another major imperative is to limit the damage and then, last, to maintain reserves. This last requirement puts another burden on C³I.

Now let me speak to the disinvestment problem. Our estimate is that the Soviets will outspend us by around \$450 billion over the period of 1975 to 1985, in areas including research, development, test and evaluation (RDT&E), procurement, and the Department of Energy (DOE) part of the account. That is a non-trivial sum. Even if we're off a little bit, or by half, which we don't think we are, they are going to outspend us significantly. That's not generally known. The bottom line message is, there is no way, even if President Reagan were to prevail on everything he wants, that we can outspend the Soviets on any aspect of modern warfare.

Student: The Soviets might outspend us, but to what degree will their capabilities be superior?

Latham: Well, we tend, in my judgment, to underestimate their capabilities by a significant amount. They have the hardware and the people. You could take almost any aspect of Soviet warfare, any aspect of equipment they're building today, and find it to be very, very good equipment. For example, their latest generation of fighters: the SU-27, the MIG-29, and the MIG-31 are three brand new fighter aircraft that have come off the production line. I can tell you without going into detail that those fighters actually have better avionics of all kinds than do our fighters — our F-16 and F-15.

In fact, they have unique avionics that we don't have — sensors and so on. Their command and control systems and their use of digital data links are much more extensive than ours. They have learned how to use digital data operationally better than we have, I think. Their strategic defense program, their high energy laser program, is extensive, and they have so many initiatives in that area, it just is staggering. They're doing very, very well at building good modern hardware. Their Blackjack bomber is even bigger than our B-1; it probably will fly further

and carry more payload. They're not that technologically inferior despite what the papers keep saying. They're actually very, very good. In many cases they use lower level technology, but they apply it better than we do.

Student: I was wondering if there is a similar comparison between NATO and Warsaw Pact spending?

Latham: Yes. If you compare all the Warsaw Pact spending and all the NATO spending, we outspend them slightly in that regard, at the theater level. In RDT&E the Soviets spend about \$185 billion. Now, our RDT&E request from FY85 to FY86 is up to \$39 billion, about a 20 percent increase over the FY85 request. We have been receiving a growth of about 12 percent a year for the last four years under the Reagan Administration. We've done very well in Congress in RDT&E. But still, the Soviets are outspending us.

In the area of strategic forces, they will outspend us by around \$250 billion, according to the estimate, in just the strategic offensive expenditures. We finally will catch up in the 1986-87 time frame, but over these ten years they still are going to outspend us by a large number. If you look at strategic defense measures, it's no contest. We had the Safeguard ABM system back in the late '60s and early '70s, but since then we killed off almost all our air defense. Now, our expenditures are starting to rise slightly; we are modernizing the North American Air Defense; we're starting the SDI research initiatives; but all that pales in comparison to what the Soviets have been spending.

They have modernized their air defenses in the country; they have something like 14,000 surface-to-air missiles (SAMs) on launchers today with reloads. They have put SA-10s everywhere. They have developed SA-11s and SA-12s. For example, the SA-12 is credited with having the ability to perform ballistic missile interception. They've built those big phased array radars all around the Soviet Union. The one south of Moscow that has gotten so much publicity for being clearly in violation of the ABM Treaty is, in U.S. dollars, about a \$1.4 billion radar, just that one.

If you consider the age of our strategic equipment and the age of theirs you see that the Soviets have modernized much faster than we have, even on the aircraft side, and especially on the missile side. This is also true for tactical fighters. The average age of

the Soviet tactical fighter force is under five years. Ours is about ten. If you look at our missile force, except for the Trident, which is less than five years old, you see we have an aging force. The Soviets are on their fourth, or even fifth generation ICBM. They have follow-on missiles in development to some of the ones that have not yet been deployed, like the SS24 and the SS25. So, when you don't invest in the system, it ages.

For a quick summary of the arms race, consider the fact that they have 62 SSBNs and we have 34. They are building bombers at a pace that we believe will provide over 400 bombers or even more when the Blackjack is put into production. By the 1990s their intercontinental bomber force will be formidable, let alone their theater force. The Soviet Bears, as you know, are back in production. Brand new Bears carrying cruise missiles are now deployed. So, it has been quite a race. They have produced a lot more hardware and continue to do so. They have so many different variants of submarines that you lose count. Whether the Soviets will ever use their weapons or not is obviously a question of deterrence, but it's scary.

I can only give you a very abbreviated and very incomplete view of Soviet C³I efforts. The story in this area is the same as with weapons: The Soviets outspend us enormously. They have built incredible complexes for leadership protection and protection of their senior military staff, and have spent large sums of money on communications. For example, the Soviet Union is littered with buried antennas. At last count there may be 3000 or more high frequency antennas alone. It's just incredible, how much they've spent in this area.

Now, let me point out a way to view C³I that is helpful from a programming as well as a conceptual point of view. I break C³I into these three functions: the warning and attack assessment functions, the command and decision function, and finally, the supporting communications. The way our system is supposed to work — I am providing a simplified version — at the very beginning there is a center box called strategic warning. We have a national intelligence system, a globally deployed set of sensors that collects data from all kinds of different places and via all kinds of different ways, and brings that data into various centers where it's processed and analyzed, and where assessments are made by the NCA. That's the so-called strategic warning picture. There

is also the attack warning system using a different kind of sensor system that looks, for example, for missiles already launched. We have in orbit today a Defense Support Program (DSP), which has several satellites on orbit that sense the infrared emissions from missile plumes, within tens of seconds of launch. We also have radars at various places that can detect things being launched and track them and so on. That information is sent back through communications into — among other places — NORAD, where General Herres has the authority to make assessments.

Now, that whole attack warning sensor system gets exercised almost every day because there are missile launches for test purposes and launches into space going on practically every day. There are about 500 launches a year worldwide. So, between the U.S., the French, the Russians, the Chinese, the British, and whoever launches missiles, we use that system and check it out so we know it works, and we know what we can see and what we can't see. There are a whole series of NCA sites that have communications to and from the forces by satellites and cables and radio systems. The forces are then under the positive control of the President as the National Command Authority. In all of those areas we're modernizing everything — the forces, the communications, and the sites.

What do I mean by enduring C³I? That's a question that is asked frequently. First of all, the uppermost requirement is having absolute control of nuclear weapons under all conditions and at every level. There's been a lot written by people saying that in the event of a strategic nuclear conflict, if the system were to go out of control it would be like a control system having too much feedback, resulting in weapons being launched indiscriminately. That is not the case; we ensure that such a scenario could never happen by the way we control the weapons and stay connected to them. That's the first major requirement of the system.

Student: Can you apply this to the theater as well?

Latham: To the theater and down to a nuclear artillery shell, to the lowest level.

Student: Why do you say that we would have absolute control of artillery once forces have been dispersed to the field and release authority's been given? Why do you assume that we would be able to maintain control once nuclear weapons have been used?

Latham: Well, first of all, you want to be able to release selectively. You would not tell the artillery it could have everything at its disposal. You would release selectively. Maybe only so many rounds, or only a particular group could be released, and the civilian authorities would know the targets they would engage before the weapons were ever used. Down to that level of detail. It's a monstrous decision ever to use a nuclear weapon.

Student: But if the release authority isn't granted as weapons disperse, you run into the problem that it may be very difficult to grant the authority —

Latham: That's right. Exactly.

Student: So then there is a problem with giving selective release.

Latham: That's exactly right. And so you've erred on the side of not being able to do it. There is a problem in the control of nuclear weapons in that you have two conflicting requirements. You want to design your command control system so that there is absolute total control of nuclear weapons in peacetime as well as during a crisis, such that they cannot be used inadvertently or in some way detonated by accident. You want the absolute highest assurance of that possible. Yet at the same time, on the conflicting side, you want to be able to release those weapons some day if you ever had to, and actually have them detonated if you so commanded. Those two kinds of things are in conflict from a technical and operational point of view. So, you have to and would want to resolve that, in our judgment, by erring on the side of safety, reasoning that I would rather not have the system be able to work than just have an absolutely uncontrollable situation. In the case of the artillery shells, if I couldn't get the word through, they couldn't be used; I probably would err on that side of safety rather than the other way.

Student: What about a situation where release authority has been selectively given already? For example, we'd like to withdraw it now to terminate the conflict.

Latham: That absolutely has to be part of the system. You must be able to do that.

Student: Well, is there no problem with jamming or interference?

Latham: Certainly. Getting the word through may be very difficult, but you can have procedures where you have selective release for 12 hours, 10 hours, or three hours. Unless you are otherwise told, you will relock your weapons after that time. That's one precaution. In case you can't get through, you tell them to relock, and not only to relock but to report that they are relocked, to send a message on that. And we have devices such that once the weapons are relocked, they can't be unlocked again without higher authority sending the right unlocks. There are many safety features built in.

Student: What do you mean by relock? How can you recall release authority?

Latham: You terminate release authority. Believe me, there are locks, literally. You relock on the weapon, be it electronically, or via software systems, or by whatever it is, that means the weapons cannot be used. You lock them back up under positive control.

Student: But does that rely on the unit in the field implementing that relock? In other words, it's not triggered from a hierarchy, an electronic signal going out.

Latham: Not to every weapon. No.

Student: You would be dependent on the commander in the field, then?

Latham: Somebody would be in the field doing something to take weapons and to put them back in storage or take them off aircraft, take them out of artillery units, and put them into safe containers and then reset the devices that relock them. We have devices on weapons that lock, so that if a terrorist took a weapon and tried to detonate it, it would not be possible. There are various levels of protection on weapons.

Another favorite topic of people in terms of enduring C³I is denying decapitation of the NCA. And that has to do with people claiming that a terrorist attack or something in the night could come in, kill the President and all successors and the other national command authorities, and as a result, prevent the U.S. from ever using its strategic force. We've taken major steps to deny that possibility. There was an

announcement made in June 1982 of a major Continuity of Government program by a special advisor to the President. We have worked on that problem very hard.

We also say we will let no "cheap shots" succeed. This means that the horror stories about some sort of an attack that could disable the whole command and control system with just a few weapons do not come true. The favorite one is the high-altitude electromagnetic pulse (HEMP) attack or a few cruise missiles sneaking in and taking out a few command centers in the dead of night.

Student: Going back to that no decapitation, is that being handled from a standpoint of ensuring that there is continuity, or is it more protection of the immediate master plan authority?

Latham: It's all of the above. It's a whole series of things to ensure that there will always be surviving legal civilian control and people there to handle the situation. So, it's protection, as well as all sorts of things.

Whatever you're doing regarding enduring C³I, you must underwrite deterrence as perceived by the bad guys. What you are doing is strengthening your hand to deal with them if they ever do anything, and, as a result of that, you complicate their campaign planning so that they can't think it through. I believe the Soviets will allege that they might be able to win a strategic nuclear war if it ever escalated to that level, and one of the things we'd like to do is make sure that they don't understand all the things we have in our bag of tricks. That uncertainty or confusion further adds to deterrence by complicating their campaign planning so they don't really know whether they can pull it off or not. Finally, we're looking for months of endurance in our C³I systems.

Now, about our overall planning efforts: I can't tell you any details really, except that there is a master plan, and it's been through three years of iteration. It has addressed C³I policy, weapons, and logistics. It is a very, very comprehensive look at the problem, and the first time that I know of that we've ever taken and dissected strategic policy, to its lowest levels, and then matched it against capabilities. We did this to see where the deficiencies are, and how to fix the problem. So, it's a very major effort.

Student: Who is responsible for it?

Latham: Well, it's headed by the Office of the Sec-

retary of Defense (OSD); my office in fact is the executive secretariat for this planning effort. And everybody participates. It has been a government-wide effort to put this master plan together, beginning in October 1981. The plan is part of a requirement that was laid on DOD from the White House. It has got very high level interest.

Now let me summarize where we are on some of the initiatives. I've broken these down into the three areas I mentioned earlier: warning and assessment, command and decisionmaking, and supporting communications. First of all, in the attack warning and attack assessment (AW/AA) area, we've formulated a new architecture that is much more robust and enduring than we've had before. General Herres is the chief architect. We're putting in over-the-horizon backscatter radars (OTH-Bs) for complete continental United States coverage against air-breathing threats. The first east coast sectors are almost completed, and the west coast sectors will start soon. We're also putting in a southern sector. Those radars will provide warning and tracking information against air breathing threats, namely, cruise missiles and aircraft. For the Ballistic Missile Early Warning System (BMEWS) radars, of which there are three, the computers and software on all have been upgraded. And we are in the process of putting in new phased array radars at Thule, Greenland and at Fylingdales Moor, England.

Finally, we are constructing two more of the Pave Paws radars in the United States. That makes a total of four. They "look" outward for incoming submarine-launched ballistic missiles; the one in the southeast will also perform space tracking. In addition, we've block-changed and improved the DSP program that I mentioned earlier, with new satellites that are more survivable and have enhanced capabilities. And we've started studies on the Boost Surveillance Tracking System (BSTS) that will replace the DSP someday. The BSTS is also part of SDI.

Student: What is block-change?

Latham: Block-change means that you move significantly from the previous satellite configuration because it begins to incorporate a fairly major set of design changes.

Now let me address the area of initiatives in communications. We have the Defense Satellite Communications System (DSCS III) now in a multi-year contract. The first of those DSCS IIIs is in orbit,

operating. We have 14 of those under contract. The second one will be orbited this year. We also have several reserve DSCS satellites in storage in orbit; we keep four DSCS satellites operating continuously around the globe 365 days a year. Another satellite system is the Military Strategic, Tactical, and Relay Satellite Communication System (MILSTAR); that's the extremely high frequency (EHF) system operating up in the gigahertz frequency range. It is in full-scale engineering development now, and a first launch is scheduled for the late 1980s. It will be a very survivable system. It will allow us to put terminals on bombers as well as on submarines and land combat vehicles. It is the first of its kind.

We also have on orbit the UHF military communications satellite known as FLEETSAT. Four satellites, plus other leased assets, provide vital global coverage. Additional FLEETSATs are being procured to maintain the UHF constellation into the far future.

We also have developed the Ground Wave Emergency Network (GWEN) — a low frequency set of towers using packet switching technology to move low data rate messages across the country into command centers. GWEN will provide assured capability of getting short emergency action messages across the C³ system. Then we have the miniature receiver terminal (MRT), which is a new receiver going on the bombers; it operates at low and very low frequencies.

The E-6A is the new replacement for the C-130 TACAMO aircraft that we maintain on orbit 24 hours a day. Not only do we keep a command and control airplane up 24 hours a day in the midwestern part of the United States, we also keep two TACAMO aircraft up — one in the Pacific, one in the Atlantic — 24 hours a day, 365 days a year, for assured connectivity to submarines. We're replacing the C-130 that does that job with a new airplane called the E-6A, which is an AWACS airframe.

Lastly we're also moving into wide-band EHF to carry more data with higher jam-resistance.

In the navigation area there is the Global Positioning System or GPS. Riding aboard GPS is the Nuclear Detection System (NDS). The GPS side of the system will be an 18-satellite active constellation at around 10,000 miles altitude, providing location in three dimensions in real time. So an F-16 pilot, for example, can determine where he is within about 30 feet in three dimensions at any given instant in

time. The system can also be used to verify the time very, very accurately. GPS can be accessed from ship terminals, submarine terminals, manpacks, vehicular terminals, and so on. NDS rides onboard the same satellites and would allow one to know instantly where a nuclear weapon went off with an estimated yield and height of burst. With NDS, in the event anything were to happen, we would be able instantly to perform damage assessment, on ourselves and on the adversary. NDS readout terminals on the airborne command posts and other places will provide this information.

Student: These are in production?

Latham: Yes. In fact, from a programmatic point of view, it's really quite a coup. The first 28 satellites are on a fixed-price production contract.

Student: When is deployment?

Latham: Well, we have several R&D satellites on orbit now and there will be 18 on orbit by 1988, and 21 by 1989. We will have full three-dimensional operational capability in 1988, and two-dimensional capability by 1986.

Student: Who will be the users of these?

Latham: Anyone who wants to buy a GPS user terminal. DOD is going to buy probably tens of thousands of them. The user terminal has been developed for manpacks, tanks, helicopters, fixed-wing aircraft, aircraft carriers, submarines — every kind of vehicle in the military that needs a GPS receiver would theoretically carry one. We will be able to provide for the first time ever, under all weather conditions, jam-resistant communications from the satellite, so the ship or the airplane will not have to communicate with the satellite but remains passive. We can update the satellite system from a central station during peacetime. So, a person who has one of these GPS receivers can know where he is more accurately than with any other system we ever had before.

Student: So this is going to all the services?

Latham: Yes, to all the services.

Student: How about the allies?

Latham: Military allies and other friendly countries may participate if they desire but we will selectively determine who that will be.

Now, GPS does two things. It provides what we call a standard positioning code, and it provides a

precision positioning code. The military will use both. Civilian users of GPS and other countries can access the standard positioning code at no cost; even the Soviets can. With the standard positioning code you can tell where you are to within a few hundred feet, so it is not good enough for targeting, but it's an accurate system nevertheless. In fact, the U.S. automobile industry is apparently going to put GPS receivers into cars. General Motors, Ford, and other companies are talking seriously about introducing the GPS receiver in automobiles in the 1987-88 time frame. A moving map indicator will be inside your car, so when you drive around you know exactly where you are.

Student: Did you say that this is being offered to the Soviets?

Latham: The Soviets can have access to the GPS standard positioning code too. Isn't that nice of us? The decision was made not to encrypt the standard positioning code, one of the reasons being that we had already decided it was pointless to try to deny it.

If the Korean airliner that was shot down had had a GPS receiver onboard to cross check with its inertial system, the pilot would probably have known where the trouble started. So, there's a major interest in the private airline industry in using GPS.

Student: I assume it's the ground unit that does some kind of triangulation. It's not like a tactical aid to navigation (TACAN) where a bird in space gives a separate channel to each user, is it?

Latham: No, the user views at least three, if not four, satellites from any position on the surface of the earth. And the system computes, from the signals that are simultaneously received from those four satellites, where the user is relative to that spot on the earth.

Student: Are these and other types of C³ initiatives prioritized, and if so, how?

Latham: Not in what I've just told you. That order is just how I happened to think of them.

Student: Well, is it done within the Department of Defense?

Latham: Absolutely. The competition for resources is such that we must prioritize all these programs, and some are going to fall off the bottom. Still, all of these that I've mentioned are fully funded and going.

Student: When you say "we," are you referring to OSD?

Latham: OSD and the services, in this case. Every one of these programs, obviously, is being executed by some service. OSD doesn't really "manage" any of them. All we do is oversee the process and try to make sure that the guidance is there, the policy is there, and that things are adequately funded. I go to Congress and I defend all these, but at the same time the services go to Congress and defend them all, too. So we try to ensure that we all sing from the same sheet of music. So, when I say "we," it's a joint team inside the Pentagon. We must do it together, and in fact something like 60 or 70 percent of the C³ programs are joint, cross-service, or interallied. The DSCS for example: everybody uses it, and the Air Force pays for the space segment. MILSTAR: the Air Force develops the space segment, and the Army, Navy and Air Force develop the terminals. GWEN: an Air Force program used by the National Military Command and Control System. ELF: a Navy system, for communications to the submarines. MRT: Air Force receivers for the Air Force bombers and tankers, that probably will go on the TACAMO E6A. The E-6 is a Navy program, but it can be used to communicate with forces other than Navy submarines. Almost everything here is joint or cross-service in some way. GPS: all four services will use it: everybody will use GPS — all the commercial world, and all the military.

Student: Is the nuclear detection system also going to be made available to the civilian world?

Latham: No, not to the civilian world. It will be available only to the military. That is an encrypted signal from the NDS. One of the things about NDS that's important from a peacetime perspective is that you'll be able to monitor the world 24 hours a day, through any kind of weather. It has multiple sensors onboard to detect whether a weapon went off, or if there was a weapon accident.

Let me give you a hypothetical scenario: Country A is building nuclear weapons. Suppose there were an accident at their nuclear weapons warhead facility, and a nuclear device accidentally detonated. Country A might claim that Country B had attacked. The U.S. President would be able to know that the explosion occurred the instant it occurred; he would know precisely where it happened, and be able to take crisis controlling action to do something about it.

That's the valuable peacetime/crisis capability that NDS will provide that we don't have today.

There are also other communications initiatives underway. JRSC, or jam-resistant secure communications terminals, are mobile or movable satellite terminals that operate with DSCS. The one commercial initiative is called the Nationwide Emergency Telecommunications System (NETS). It's an initiative that will upgrade and make more robust the public switched telephone network. We've invented a "box" (or Bell Labs has, with our money) that can be put on certain switches. The way the U.S. public telephone switched networks operate is with very, very large switches, then medium-sized switches, and then some smaller ones. The smaller ones are called class four and class five switches. There are about 20,000 such switches in the country. Now, at the moment, there may be only two or three possible routes to connect points A and B (for example, from here to San Francisco). But when we put this box, which is really a special purpose small computer, on a few hundred of those switches, we'll be able to go by hundreds of routes. So having NETS in place will provide a much more robust communications network using those billions, or tens, or hundreds of billions of dollars, whatever we've got sunk into the local PTT.

In the functional area of command and control, we've built, deployed, and delivered four E-4Bs, the highly modified 747 aircraft crammed full of communication equipment that are called the national emergency airborne command posts (NEACPs) for the President. They are deployed now in the middle western part of the United States; they're not at Andrews AFB any more. They sit on five minute alert, or at least one of those aircraft does, 24 hours a day, 365 days a year. We are also modernizing the worldwide airborne command and control platforms, and will continue to do that. They are receiving new electronics, new communications equipment, and things of that nature. We have about three dozen of those. We're hardening systems against high altitude electromagnetic pulse effects and we're doing a lot of special studies on how to do an even better job of providing for a surviving command and control function.

Student: Do you have any of the E-4Bs at Andrews?

Latham: No.

Student: Do you have any other emergency aircraft?

Latham: Yes, we keep other aircraft that are on special alert to get the President out, but they're small aircraft.

Student: They don't have all the command/control equipment?

Latham: We have a Presidential support squadron that has special helicopters and things of that nature for coming in and getting him out of the White House if that were necessary. Now, the probability of something like that happening — that is, if the Soviets or some bad guys could so surprise us that we have to panic in the middle of the night to get the President out of the White House — we consider highly unlikely. The U.S. system provides us with the ability to tell if something is up and take much more measured actions anyway. So, I don't look at moving the President as the most probable situation, and that might send a wrong note anyway.

So those are the C³ initiatives. Incidentally, as I mentioned earlier about strategic defense, we actually have three integrated strategic defense capabilities being worked on. The first of these to go in is a new modernized North American air defense with new sensor systems, some additional AWACS, and some additional F-15s and F-16s. It is nothing like what the Soviets are putting in, but it is at least a small air defense system that would deny them free access to the continental United States. The big challenge is: What do you do with cruise missiles that would be launched against us — especially submarine-launched cruise missiles?

Let me go to the budget story. The major message is that — summarized from the 1940s to the 1980s — defense spending is about seven percent of the GNP, and around 28 or 29 percent of the federal budget. If you look at the non-defense area and how it has grown, that's where the real problem is. The non-defense budget has just grown enormously over the years, and we're trying to cope with that now. The human resources areas spend around 48 percent of the federal budget, or around 11 percent of the GNP. So, we've gone down, and they've gone up, and the name of the game is to try to get that more back in balance.

Student: What principle is there that says that should be in balance?

Latham: It is not necessary that it ever must be in balance, but if you're concerned about the so-called

deficit problem, which is a real problem — we're spending more money than we're taking in — then you've either got to cut down on the spending in some areas or you've got to raise taxes or do something to increase the revenue. Now, if you want to hold defense spending at around seven percent of the GNP, which is what we've proposed — we haven't said let's go to nine or ten, just hold it at roughly seven percent — we've got to cut back in the human resources area to start attacking the deficit. That's what President Reagan has been proposing for this fiscal year and the out years. If you look at what Mr. Reagan proposed back in 1985 for FY86 we actually have reduced the 1986 request by about \$36 billion already. In other words, the \$313 billion that we've gone in for now is actually down \$36 billion from where we were 14 months ago. So, we've actually been hacking away at the defense program pretty badly, frankly. We have not gotten much more in the FY85 and FY86 budgets than Carter was proposing in his FY81-85 defense program — believe it or not.

Student: But your conclusion on the percent of GNP going to human resources as opposed to defense is based on the assumption that we should maintain defense spending at approximately the same percent.

Latham: Yes, and at the same time be conscious about doing something about the deficit issue. Plus, I think that the human resources side is just going out of sight. Look at the Medicare program. It's incredible.

Student: In going from the out years in FY85 to the actual budget in FY86, were any major systems cut, or were those just savings realized in lower inflation rates, fuel savings, and the other benefits we've gotten from a stronger economy?

Latham: I think it's mostly the latter. No major weapon systems have really been sliced out of the budget. There have been some threats to do that, but nothing has really been killed yet. The (Division Air Defense System) DIVADS is an example of one that might get the ax, and (advanced medium range air-to-air missile) AMRAAM is another one.

Well, if you wonder what's in the C³ mission area, it's all of this (see figure 1).

What we've been talking about is just that upper left box called "strategic," and a little bit on navigation. But all the rest you see there is another set of complicated areas, so I'm very busy trying to keep

up with all this and to stay on top of it for OSD oversight.

To give you some idea, the total C³ request in FY86 adds up to \$22.1 billion, of which strategic is around five billion, theater tactical a little under four and communications security (COMSEC) about one billion. The C³ total was \$18.5 billion in FY85, so our total FY86 C³ request is 19.5 percent higher than FY85, which includes inflation of about 3.5 percent.

Oettinger: That does not include the intelligence portions that have recently been put under you, does it?

Latham: No. It does not include any intelligence.

These are the figures we have requested. Now how well have we done? C³I has fared better than the defense budget as a whole over the last five years. If you compare the annual increase in C³ funding against those of defense over the past several years (we've gotten 17.9 percent, 12.4 percent, then 13.5 percent), you can see that every year C³ has received several percent more than what defense as a whole has received. Now that C³ is in at a 19.5 percent request for FY86, if you take inflation out at around 3.8 to 4 percent, C³ is requesting at 15.5 percent real growth, and defense is at 5.9 percent real growth. If we get cut to 3 percent overall on defense (which is probably where we'll end up — if not worse), I'm hoping that I could come back next year and tell you that instead of getting 19.5 percent I received 14 percent, or something like that. Generally C³ has been able to prevail and get much better numbers than defense as a whole. But that also tells you that we've really, really been putting the money to it. And if you look back just a few years, C³ was nowhere near this size. In fact, C³ back in the late 1970s was way under \$10 billion. So, we have grown enormously, and we're putting big bucks against the area; it has the priority, and it has the momentum.

Student: You mentioned the President giving emphasis to C³ and your role in DOD. Who are the individuals in the Congress and the Senate who are either receptive or....?

Latham: Well, I went over and sat down personally with Barry Goldwater (R-AZ) and the Senate Armed Services Committee yesterday morning, and generally that's a Republican-dominated committee. I find that both sides of the committee are very supportive.

<p>Strategic C3</p> <ul style="list-style-type: none"> • Strategic C2 • Strategic S&W • Strategic COMMS 	<p>Theater & Tactical C3</p> <ul style="list-style-type: none"> • Theater C2 • Theater COMMS • Tactical C2 • Tactical COMMS 	<p>Navigation/Warfare Command & Control</p> <ul style="list-style-type: none"> • Land Warfare • Air Warfare • Naval Warfare • Navigation & Position Fixing 	<p>Support & Base Communications</p> <ul style="list-style-type: none"> • Support COMMS • Base COMMS
<p>EW & C3 Countermeasures</p> <ul style="list-style-type: none"> • Self – protection • Escort; stand – off and counter C3 • Tactical surveillance, recce. & target acquisition • Multimission, technology & support 	<p>COMSEC</p> <ul style="list-style-type: none"> • Communications and signals security 	<p>Information Systems and Defense Communications Systems</p> <ul style="list-style-type: none"> • Information systems • Computer security • Long haul COMMS • Comm. services industrial fund 	

**Communications Command and Control (C3)
Mission Area Structure**

Figure 1

Senator Glenn (D-OH) was there, and Senator Warner (R-VA) has been especially supportive. With few exceptions, we've had excellent support out of the Senate in this area. I think the priority has been recognized in the Defense Guidance and various national security decision directives; we've had excellent budget support within DOD and in the Congress. Up to that 19.5 percent for FY86 those are real, appropriated numbers I gave you.

The modernization program I think is defined and it's well under way for both weapons and the supporting C³I. As I said earlier, I think a survivable and enduring C³I system can add to the stability of deterrence, it can provide flexible control of your systems, it can be traded off against weapons, and it can assist arms control initiatives. All of those are real benefits if you have a really good C³I system, and I mean a system that encompasses both C³ and intelligence. The real bottom line, though, is that there's a lot to do; just to get MILSTAR in orbit and get all of the hundreds of GWEN nodes in will take a lot of work. It's not easy, it's going to take time, probably a decade. So I won't necessarily be able to come back next year and say, "Hey, everything's in really good shape." It's just going to take a long time. It's an area that was neglected for many years.

Oettinger: The way C³I was treated five, six, or seven years ago was not just benign neglect, but a sort of vociferous, total, abject neglect. The trend started to turn a bit in the Carter Administration, and clearly grew in this administration with the programs in which you have been so instrumental. How deeply rooted do you think this is now, both in DOD and in the services? Is there a momentum that would carry forward? Or is it still the sort of thing where you've got to keep running just to stand still?

Latham: Well, my perception is that unless somebody is just as pushy as the dickens and is a spokesman for this area, people will tend to fall off of it. The institutionalization is there to some extent, and there's a much improved perception by the senior management and the military, but I can tell you that I was not impressed with the Air Force 1986 Program Objective Memorandum (POM) on the strategic C³ side. It said they supported this, and that it had the highest priority in the program, and then proceeded to propose delays, delays, and more delays in several major initiatives such as the OTH-Bs, Pave Paws, and on and on. So, we went back and fought for them before the Defense Resources Board (DRB)

and won most of those back. But the competition for resources inside, where communications satellites have to compete with F-15s, gets tough.

Oettinger: Are there career paths in the services that are beginning to be more rewarding for the people in intelligence and the command and control of COMs?

Latham: I think there are. In fact, there are some very rewarding jobs. However, the services haven't done as good a job as they should have in growing people in that side of the business. General Herres is a good example. He's gone from an operations job to where he went in the JCS, when he was Director of JC³S.* Now he's a four-star at NORAD, which is really a command and control job. And the betting is that Bob will be the first commander of Space Command.

Student: I was wondering if you could address the question of arms control in the ASAT area. It seems a lot of things that you mentioned have to do with survivability of satellites and the need we have for them. How does that approach fit in with the verifiability of an ASAT treaty and things like that?

Latham: I don't think you could verify an ASAT treaty. No way.

Student: Does that mean any attempt to go after an ASAT treaty is useless?

Latham: I don't think that it is useless, but don't kid yourself into believing someone when he says such and such is verifiable, because there are many different forms of ASATs. They don't have to be this obvious, or overt, thing that flies up from the ground and sprinkles out pellets or whatever in space for the satellite to run into. They can be much more insidious and smarter than that. The first thing they would do would be to use electronic means against our satellites. And how do you verify the purpose of all those antennas all over the Soviet and other landscape? So, I would contend that an ASAT treaty is unverifiable unless there is comprehensive on-site inspection, which I doubt is in the future for anybody and which could still leave you doubting.

Student: So, are your systems designed to operate in a world where there's competition in ASAT weapons on both sides?

*Joint Command, Control, and Communications Systems Directorate.

Latham: Absolutely; if you don't do that you're kidding yourself. You've got to try to make your space systems as absolutely survivable as possible. For example, the MILSTAR has survivability features that we've never put on any other satellite, and the technology's there now to do it. Yet I think we're in our infancy in space systems survivability. If you look at how we've evolved the airplane, the airplane went from bi-wings carrying guys with pistols, to bi-wings flown in World War I with machine guns that were synchronized through the propellers, and then finally we added electronic warfare protection devices, and we've added radars, and we've added off-board decoys, and so on. We're going to do the same thing to satellites. Satellites that will be able to sense when somebody is attacking are going to throw out decoys; they're going to move; they're going to change color or something.

Student: To what degree do those kind of devices on a satellite subtract from the main mission of the satellite?

Latham: Well, launching a satellite into synchronous orbit from the shuttle today costs over \$100,000 a pound. So for every pound you have, just add up a \$100K note. That's the penalty.

Student: I'd like to address something that you just glossed over; I'd like a little elaboration on it. You said our forces in the military operability section are reacting to ambiguous warning or after an enemy has seized the first initiative. About four months ago, Dr. Ashton Carter wrote that there are certain missile warning sensors in the entire C³ concept as an integral piece — bombers, aircraft carrying cruise missiles and airborne command posts — that would all need immediate warning to enable them to escape near base for a 10-minute SLBM flight or the 30-minute ICBM flight. He then writes, "If a launch-under-attack threat is to be credible, the U.S. must show that it can reliably receive early and accurate evidence of an attack by the U.S.S.R."* Aren't those two conditions at counterpoint? What are the ambiguous warning scenarios to which you alluded?

Latham: Well, the ambiguous warning I mentioned has more to do with the area of strategic warning. Before anybody has launched anything, there are strange things going on that you can detect and make assessments on, but you don't know really what the outcome will be. For example, the enemy moves

another 10 percent of his submarines out of the harbors where they are kept, and he puts them out to sea. That's not enough necessarily to arouse suspicion, but the number is going up — there are several more going out and disappearing. He's moved a number of aircraft around for some strange reason. That sort of thing is the ambiguous issue I was talking about. If somebody has launched an SLBM against the bomber bases, there is a high probability we're going to know that within tens of seconds of launch and be able to flush the bombers and the tankers off the bases and get them out from under harm's way. Now you can't get the ones out that aren't on Quick Reaction Capability (QRC) alert, but the ones that are sitting there on high alert you can get out.

Student: So, our C³ operability is designed to get them out under an actual launch-on-warning situation?

Latham: The ones that are on alert, and we only keep a certain percentage of the SAC force on alert, not all of it. Incidentally, that would in itself be another indicator. Suppose that all of a sudden the Soviets put their bomber force on some sort of a QRC alert, and suppose through some magic sensor we learned that. But the enemy hasn't fired any shots yet, nor has he sent any bombers against us. What does that mean? Why is he doing that? Those kinds of things would help alert us.

Oettinger: If I might just interject a little note here, this term ambiguous warning is kind of nice. If you recall the presentation given last year by David McManis,* he asserted that we could always warn. That's a controversial position. But if you accept warning as ambiguous, you then slice through the debate to the question of what does the warnee do with the ambiguity.

Latham: If you go back to Caspar Weinberger's posture statement of FY83,** there's a whole section in there on warning. It describes the concerns that he has for warning, strategic warning in particular. It describes what that warning means. He talks about ambiguous warning. There's a whole unclassified discussion of it in that posture statement. It's worth reading.

*David McManis, "Warning as a Peacekeeping Mechanism," *Seminar on Command, Control, Communications and Intelligence*, Spring 1984. Cambridge: Program on Information Resources Policy, Harvard Univ., 1984, pp. 32-39.

**Caspar W. Weinberger, *Annual Report to the Congress: Fiscal Year 1983*. Washington, D.C.: GPO, 1982, pp. I.11-I.14.

*Ashton B. Carter, "The Command and Control of Nuclear War," in *Scientific American*, January 1985, pp. 32-39.

Student: There is a world of difference between strategic and tactical, though, in that calculus of ambiguity and so forth.

Student: Can you tell me a little bit more about strategic warning and who actually does the intelligence fusion on that? I get the idea that NORAD does a lot of tactical warning and I was wondering if you could identify and say a little bit more about who carries out the strategic warning functions.

Latham: Well, there are numerous watch centers around the world and in Washington. And intelligence of all kinds from globally deployed sensors comes in 24 hours a day to these centers, where it's assessed and the information is correlated and fused with other sensor information. You can not have some of the dumb things that were in that *War Games* movie ever happen because there are multiple sensor checks on things. It's important to resolve ambiguities.

There are watch centers in the Pentagon. We have the National Military Intelligence Center in the Pentagon, and the National Military Command and Control System has a center in the Pentagon and at the Alternate. Those are manned 24 hours a day by intelligence officers and operations officers who sift through this information as it comes in. They plot, show, and display intelligence items. So, it's done in several places.

There is also a 24 hour watch center at the White House, and at NORAD. NORAD not only gets information from radars and DSP satellites, but it receives "all-source" intelligence information. So NORAD can, in fact, correlate what's going on and see if, in fact, the bad guys are trying to spoof us into doing something stupid.

Student: In a crisis, would the focus of the strategic warning intelligence shift to any one of those places?

Latham: Well, probably into the Pentagon more so than any other place.

Student: Prior to that shift, doesn't the flow of strategic intelligence come predominantly from the Director of Central Intelligence?

Latham: Well, he is the responsible person, as the principal advisor to the President for intelligence. So his function would be to bring to the National Security Council, the cabinet, and the President his assessment of what is taking place 24 hours a day. In fact he performs that function by providing daily

reports and briefings to the President and others. So it's a continuing function.

You mentioned shift. The way the system is set up, there would not really be any shift per se. Things would intensify perhaps, but they are not going to shift all of a sudden. The idea is to build the system, for both C³ and intelligence, in such a way that the transition to war, if it has to occur, is smooth, not a disjointed effort requiring that all of a sudden you have to move a lot of people into strange rooms or whatever.

Student: I just meant that in a crisis situation with limited time, it seems as if the decision maker's attention would shift to a particular group of people who were interpreting the strategic warning.

Latham: Well, we have the National Intelligence Officer for Warning. But there are people in the system whose function it is to be warning-conscious, I would say. They are looking at all these various indicators and what is happening in the world, be it Cambodia, South America, or the Soviet Union, trying to figure out what's happening. In some cases it's relatively easy; in other cases it isn't. Now, we're deploying tactical sensors that are going to allow us to do a much better job on warning. For example, over in NATO we're deploying on the TRI (which is a high altitude, long-endurance manned aircraft, the tactical version of the U-2 "spy plane") a radar called the Advanced Synthetic Aperture Radio System (ASARS), capable of penetrating deep into somebody's territory. You stand off in orbit and turn this radar on, and it goes off a hundred miles or so to detect targets such as aircraft sitting on runways — not only detect them, but image them. You can tell they are airplanes. And under the right conditions you can tell that it's a bomber or a fighter, and in some cases you can tell what fighter. And so, with that aircraft and that kind of sensor, we will be able to have day/night, all weather capability to get information from behind enemy lines, and there isn't anything they can do about it.

Student: Once you get all this information, what do you do with it, and how do you prevent our looking at the Soviets from causing us to increase alert, their looking at our increasing alert causing them to increase their alert, and this sort of a self-escalatory situation? Is there any organizational or built-in safeguard against that?

Latham: Well, it's called human judgment, I think,

more than anything else. Since many people participate in the decision process and in the assessment process, you hope that cool heads prevail and that no one will do something stupid. In Mr. Weinberger's same (FY83) posture statement, he talks about reacting to warning and being prudent about reacting to warning, and practicing reacting to warning. One of the things that's always been part of every military campaign is surprise. So, if the Soviet Warsaw Pact saw that we had some mysterious capability such that somehow we knew what was up every time they made a move, even just to test us out, and we reacted to those moves (as we can, under certain conditions), it would be a great deterrent to them to know that surprise attack is not going to work. So doing your warning function is very, very important, and how to do it is very critical. And it's all part of what I would call the great tactical deception situation. The enemy might, and very likely would, do all kinds of things to deceive you, to make you think he's doing something else.

McLaughlin: If you're interested in this point, it's worthwhile going back to last year's proceedings and reading the McManis presentation and also the one by Richard Beal.* They consider the whole structure of daily briefings on crisis management that try to anticipate where the day's surprises are going to come from, so as to remove some surprises day-by-day.

Latham: This is one of the areas that I wish I could tell you more about, but I can't, and it looks like there's a hole here. Something's missing. You have to take it on faith that we've really done a lot in the last four years to provide a capability for the President and others to have information presented to them, to have places where they can go see this information and confer about it, and other things, all in order to keep crises from getting out of hand. And that's very, very important.

Oettinger: But there remains, I think, this element of the eyes and ears; and although they may be operating well and without gaps in information, it comes down ultimately to someone's judgment as Don pointed out. To my mind the best unclassified source

about the problems at that end remains William Gulley's *Breaking Cover*. It's sort of the confessions of a household barber in some respects, but, given that there are gaps in the public unclassified record, I still know of no other comparable unclassified source of some insight into that last stage of decision making, where you've got to get into several people's heads and then figure out what those heads are going to do. That is not only a U.S. problem, it's a Soviet problem as well; it's anybody's problem. But it's a dimension that you need to fill in along with the eyes and ears.

Latham: Again, there has been a lot of writing and speculation in the papers vis-a-vis Star Wars and other issues, speculating that somehow we will automate this process and take people out of the loop. I think it's exactly the opposite. We will certainly try to develop what I'll call decision aids that will help someone sift through the incredible amount of information coming from sensors like ASARS that we're now building. The ASARS, a downlink from the TR1, comes down at over 200 megabits. When you're handling hundreds of megabits of information and you must reconstruct it into images on the ground with processors, you need computers. But in the end, you still want to have humans, who can do things much better than machines can today, even with all our sophisticated artificial intelligence techniques, and probably always will. The human mind has the ability to do things that we don't begin to understand. It correlates facts and looks at things and so on. We'll always, always keep people there to look at these scopes, and do that final assessment and correlation function. Even in SDI, where things could happen very rapidly, you're just simply not going to turn the system on "automatic." No way.

In fact, a good example is a Star Wars defense system, although it has been so badly misrepresented in the press. If we truly had a multi-tiered SDI system -- and don't ask me how we'd get that -- but suppose you had one, the first tier would be boost phase engagement. There has been a lot of writing saying, "Well, since that happens in two or three minutes, you would have to turn the system on automatic would you not?" That's absolute baloney, because if I have two more tiers behind me, I could let the first ten, twenty, or the first hundred of them through, whatever. Then I could be absolutely certain that meant war.

Student: Or you can shoot.

* Richard S. Beal, "Decision Making, Crisis Management, Information and Technology," *Seminar on Command, Control, Communications and Intelligence*, Spring 1984. Cambridge: Program on Information Resources Policy, Harvard Univ., pp. 5-20.

Latham: Yes, and nobody gets hurt. You're just killing boosters. So there isn't one single human being killed, and if you made a mistake, what would the consequence be? It's all been blown out of proportion.

But even then, you would not set this thing on some sort of a so-called hair trigger, take people out of the loop, and assume now we're automatically at war. That's ridiculous.

McLaughlin: Well, the reference to the time element made me think about the Beal presentation. I think his observation last year was that, at least from the viewpoint of time, as a superpower we could afford in most crises to move slowly rather than quickly.

Beal was saying, for example, in the KAL 007 situation that perhaps we moved too fast simply because we knew what was happening faster than the Soviets did. And he said that in some of these cases it may behoove us to move with less speed.

Latham: But there was nothing we could have done to save that shoot-down.

McLaughlin: No, he was commenting on our reactions to it. He wasn't implying we could have done anything before the fact; he was saying afterwards that Secretary Schultz, for example, probably knew more when he was addressing the United Nations about what had transpired than the Soviets had been able to reconstruct at that point.

Oettinger: If you accept the point that people are very much in the loop, then one of the critical elements — and, again, we're back to the McManis and Beal materials for some more facts — is this fundamental balance in terms of how much gets up to decision makers. If you let too much through, they haven't time to digest it, causing problems of absorption, limited attention span, understanding, etc.; you overload. If you don't let it all through, there's a selection problem. The minute you start selecting, there are people doing the selection, and the minute people start doing the selection they acquire a certain amount of bureaucratic and/or other power, and so you have a constant instability in that.

The question of how to organize to do this almost becomes a contradiction in terms. The minute you organize there's somebody who sits on top of the

pile. Everything you've heard, both last year and this year, about the little word "through" in the role of the Joint Chiefs in the chain of command becomes an issue. So much of the problem of where that balance is in the flow of information, in the flow of warning and so on, rests on that question of whom does it go through. Is it formally organized? Is it not formally organized? If you organize too much you have sources of independent powers tending to thwart lines of communications, but if you don't organize enough, everybody gets snowed, and nothing happens. There is no permanent solution to that problem, because it depends on who is on top — the commander-in-chief — and that position varies with each administration.

Latham: I agree. As far as the C³I master plan is concerned, the question is what does the President, with his three hats on, need in the event of strategic nuclear war? What information should he have access to, how do we provide it, and from what places? He can't carry around all that information with him. How do you do that? And then, how do you ensure that whatever data bases he might need could somehow be stored somewhere survivable so that you could have communications access to it? Then, whoever makes those decisions is, as you say, part of the bureaucratic process. So, it's a very complicated situation and it gets into some very advanced technical areas of distributed data bases, multi-level security, and all of that, trying to figure out the sequence and logistics of such a scenario. Nobody has ever thought of it before. How would you reconstitute this country if it ever did go to war and was devastated? So, it's a very complicated problem, and Richard Beal and his crew addressed that problem in some detail in creating various crisis management capabilities which we now have within the federal government. Be it Lebanon, for example, or be it total nuclear war.

Student: When Secretary Weinberger recently made changes in his office structure, what were the implications of going from being a Deputy Under Secretary to Assistant Secretary? What are the implications of the shift?

Latham: Well, they made me Assistant Secretary before they reorganized. The perception of Congress

was that the function of C³I was sufficiently important that it should have the highest possible visibility and focus within the department. So they were quite emphatic that Secretary Weinberger should create an ASD(C³I) out of the deputy. The C³I position in OSD had been an ASD position before, but it wasn't a statutory ASD. When Mr. Weinberger took over, somebody in the bureaucracy had decided to abolish the ASD(C³I) position, and make it a Deputy Under Secretary. They took the ASD billet and gave it to some other part of the bureaucracy. So C³I was not a statutory ASD. Congress didn't like that, so finally, after two years of struggling within themselves and within the department, they got an ASD(C³I) position authorized and voted into law. And now it is a statutory position, which means that the Secretary cannot abolish the position without prior approval of Congress. That happened last summer. It took two and a half years to make all that happen.

In the meantime, there's been a lot more Congressional and DOD feeling that the C³I area should be more centrally organized than it was even last summer. In particular it was decided by Mr. Weinberger that the policy side of C³I, which resided with the Under Secretary of Defense for Policy, should be brought under one position called the ASD(C³I). On January 29, 1985, Mr. Weinberger issued a memo reorganizing his staff and creating a new ASD for Acquisition Logistics, number one. Then, number two, he moved my job out from under the role of the Under Secretary of Defense for Research and Engineering, so I now report directly to Secretary Weinberger. He put under me, as the ASD(C³I), the various policy people — COMSEC policy, intelligence policy, C³I space policy, all C³I policy — and some additional resource staff. And that was the intent of the Congress for that to happen.

Student: Do you know if the Soviets have a capability equivalent to the nuclear detection system that you mentioned before?

Latham: I don't really know. One would presume that they do. I don't think they have anything as sophisticated as ours; they certainly don't have a global positioning system yet. They are copying ours. Their program, called GLONASS, appears to resemble ours almost to the letter. It's a similar system, but it's way behind us in deployment, and probably won't have 18 satellites as does ours. They filed for I think nine or twelve. But I guess that they

would probably put a space-based sensor on those or somewhere else to detect nuclear explosions.

A reliable nuclear detection system is a good capability to have. They'd like to know what is going on. What if there were an explosion at some nuclear weapons storage site in some country, by some strange fluke? I don't think it should happen, probabilities and statistics being what they are — but suppose that happened. What really happened? Did the Soviets attack? Where did it happen? At precisely what time did it happen? You would want to know that. That sensor system would provide that. So, far short of nuclear war, that sensor device has major value to them and to us. Remember, off the African coast two or three years ago, there was (supposedly) a clandestine nuclear test. Nobody to this day, except the guy who did it, knows whether that's truly what it was. And if we'd had this NDS up, we would have caught that.

Student: So, you would say that we have an interest in having the adversary know as well.

Latham: That's why I'm telling you. We want the enemy to know that we have certain capabilities; we want them to know that. It's part of the deterrent.

Student: But we even have an interest in ensuring that the Soviets have that kind of capability.

Latham: Well, I have thought about that, and in fact, I would not feel bad at all about giving them access to NDS. I think that that might be something that we should eventually offer them. They would be very suspicious, and they would think we had doctored the data. To doctor the information coming to them out of an NDS system in any way would be dangerous. You want it to be of the highest quality, with the lowest false alarm rate system that you have. You don't want to have false alarms of a weapon going off because of say sun glinting — that's why we have multiple sensors. There's a light sensor, an x-ray sensor, and an EMP sensor. And if the sensors don't correlate, it's not going to be called a nuclear event. We've taken all kinds of precautions that way.

Oettinger: Just a point of clarification. In *Aviation Week*, there's a thing referred to as IONDS; is that the same system?

Latham: Yes, it used to be called the Integrated Operational Nuclear Detection System, IONDS, only now we've dropped the IO.

Student: It's not difficult to complicate a sensor packet; there's no reason they shouldn't be able to do an adequate job of that. Its quality is tied a little bit to the quality of the navigation part of the system on which it is piggy-backed. They have to be able to know whether they've got locations that are definitely significant. There's no reason they couldn't do that.

Student: On a slightly different topic, the Soviets have already gone to land-mobile launchers, and there's some discussion about the SS-25 suggesting that they might be considering a Mobile Positioning System (MPS). Would you address the C³ problem in targeting their land mobile systems and then relate that to an evaluation of an MPS basing mode for either the MX or the Midget Man?

Latham: Well, a mobile SIOP* target base creates an enormous problem in terms of a targeting program because you've certainly got to locate them in order to target them. But, then again, that may have some benefit in terms of stability by adding to the deterrent. The enemy has truly made the destruction of his retaliatory force much more difficult, and as I explained earlier, that would add to your uncertainty if you were seriously contemplating nuclear war. So our going to a small mobile ICBM — that is, a land mobile system that can run around like his SS-24, and over thousands of square miles of land — adds to his great uncertainty as to whether or not he can take out those forces, whereas hitting a fixed silo is a much easier job. And the result is that the command and control and intelligence job is tremendously complicated by such things because now you have to search, locate, and identify the mobile targets. It's a very, very difficult thing and the Soviets are very good at hiding things — big things.

Student: So, what you're saying basically is that, contrary to what people say, the stability brought on by moving to multiple kinds of launchers on both sides really will not be eaten up by advances in C³I that could identify and target and so on.

Latham: Yes. Not for the foreseeable future, and the Soviets have a tremendous advantage over us there because they have so much more land area to use. Plus, they have the world's largest railroad system. So they have an enormous opportunity to hide things, and they are very good at cover and deception. And

they practice all the time. With the SS-20, we've seen them go to extraordinary pains to hide these things in trees, and unless you really look very carefully, they're very, very hard to pick out. It's going to make our job very, very much more difficult.

Student: I'd like to shift away from the strategic to the tactical. Charlie Beckwith, who was the Delta Force commander on the attempted Iranian hostage rescue, commented on the C³ that he had. I'm addressing the system rather than the particular technology; I guess they were UHF satellite terminal packages at various points, but it's not significant whether they were UHF or some other frequency. He said the communications were basically good, and that the interplay went well between the various elements in the hierarchy, and that the command and control structure was a model for jointness. And yet there have been various allegations that, in Grenada, command and control could have been better. Some of the stuff I've read in various articles (all of it unclassified) say the radios for some of the ground forces were too heavy and they couldn't keep up, and there were other things about air strikes not being well coordinated. From your perspective what might have, or what should have been some of the lessons learned?

Latham: Well, there's an interview with me in the February issue of the *Armed Forces Journal International** that asks that same question. And my answer is that we really didn't do the pre-invasion planning that is normally required by the communications and command and control people in order to get various aspects of the communications plan really straightened out — who was going to have what equipment, what COMSEC was needed, and all that. So, it was a planning deficiency brought on by the very high secrecy and the short time that they had to get the job done before they went in there. That was really it. The equipment is designed to be interoperable, and there's adequate equipment around. It just was a very closely held, very short-term planning job done. The commander of the whole task force admitted publicly in a speech not more than a month ago that he'd never heard of the PRC-101 radio until about two days before the invasion. That's a hand-held

*Single Integrated Operation Plan (the U.S. strategic nuclear war plan).

**"An Exclusive AFJ Interview with Donald J. Latham," in *Armed Forces Journal International*, February 1985, pp. 54-70.

satellite radio. You must know what you're doing with your communications or you're going to get in trouble. So, he had trouble.

McLaughlin: I can see other situations where one might have more time. It seems to me that any commander going into an operation like this, even if he had more time, will still want to maintain surprise. The secrecy is going to be the continuing problem and the losses entailed are in part the price of that secrecy. This is a problem that comes up time and again.

Latham: That's right. There was a trade-off; they made a judgment that secrecy was more important than anything else, and paid some price for that.

Oettinger: But wait a minute. That's the sort of fix one is in as of the week, the month, or the year before Grenada. The real problem is when you're in Grenada. Think of it this way: one of the classic elements of the spy story is the phone booth. Why? Because the phone booth is there, and nobody knows I'm walking up to it, and yet I have the guarantee that no matter what phone booth I walk up to I can talk to some place. So, it seems to me that more fundamental than the matter of either secrecy or surprise is the problem that one cannot count on the notion that whatever piece of equipment one walks up to, whether it's in the clear or encrypted, one has a reasonable chance of reaching some other instrument in the friendly forces. There is the root of the problem. Why can't one count on walking up to a bit of communications gear in the U.S. military and have reasonable assurance that it'll communicate with another friendly piece of communications?

Latham: Well, I think that we're rapidly getting there in most cases. The mean-time-between-failure rate of the VHF combat radios out there today is unacceptably low. So, when you walk up to a VHF radio mounted in a jeep today, turn it on, and hope you can talk to the brigade commander, it may be that it doesn't work because it's failed for some reason. That is a fact of life of all radio systems, and even telephone systems (although we've made these far more reliable over the years, at least in terms of fixed plant).

Now, the new radio that replaces the VRC-12 has at least 10 times the reliability, so we're more confident now that when somebody uses the radio, he can make contact with another radio of a similar kind, and using the same COMSEC. In some of

our aircraft radios now we're getting a mean-time-between-failure of thousands of hours. So the ability to communicate reliably is getting better and better. We're experiencing exceptionally good performance on our satellites. These DSCS satellites I mentioned are lasting years and years longer than their life design had intended. So you can have some confidence, as Beckwith did, of being able to have a satellite terminal that will in fact work over that satellite. We used those in Grenada, and Beckwith used those — both SHF and UHF — in Iran and they were used in Beirut. And they worked pretty well. They had good clear voice, good quality voice. So, it's getting better.

Still, if you want to talk across services (and that came up in Grenada, about cross service communications with different types of radios, using different types of COMSEC equipment) you're probably going to get in trouble. And that's what happened in Grenada, because they didn't have the right stuff there; they hadn't planned for it. The special forces brought in their own communications, which were unique to them. So, carefully planning this out could have solved a lot of the problems, but again, there was an insatiable desire for information, so people were trying to pass tons of information back and forth both ways, and things got congested and broke down in that sense too.

However, we do have a program called Joint Interoperability of Tactical Command and Control Systems (JINTACCS) which is a joint, cross service effort to make sure that tactical command and control systems are, in fact, interoperable. We will spend about \$100 million on that in 1986 doing tests, promoting standards, setting up various testbeds, doing simulations, and trying to be the keepers of the interoperability. It is a very difficult problem to keep things interoperable, and keep people using the same things. Today we can take an AWACS airplane, "drive" it out to sea, hook it up with a battle group, and pass tracks in real time from an AWACS to a battle group commander sitting onboard an aircraft carrier.

Now, you just don't "drive up" and in two minutes you're hooked up and everything works. It's a complicated set of procedures and different battle groups in different parts of the Navy have different operating concepts. The Second Fleet doesn't operate like the Sixth Fleet, believe it or not. They have different call signs, different procedures, and so on. But it is

literally possible today, because of things like JIN-TACCS, to have AWACS directly supporting the battle group in real time. That's an unprecedented situation. So, it's beginning to be better and better, but we're a long way from having it as good as I would like to see it.

Student: Unless I didn't understand completely, the operations security dimension to the Grenada problem is that it would be possible — or have you volunteered? — to make C³ compatibility and other C³ concerns a routine part of emergency operational planning. Presumably to mount this operation they had to do a lot of logistics planning and a lot of operations planning, so there were perhaps a small number of people working under a lot of constraints on how they could reach out into the system to pull in expertise. Were you satisfied that they were sensitive enough to that issue of communications, or is there anything that the C³ community could do to make that process easier? A team or something like that, or a designated person in each of those situations?

Latham: Well, what they've done now, for example, is to have what they call a "generic" C³ plan. That is, you fill in the numbers and the specifics of a particular operation, but it lays out all the things that need to get done, so that they've taken those precautionary steps and made checklists and things like that. There's not much more you can do than that except make sure that the equipment that is expected and needed is in the pipelines, procured, and deployed.

Student: Or even being aware of your deficiencies before you go into battle.

Latham: Yes. To give you some idea, just in communications and electronics equipment alone, Army procurement for the next five years will be \$29 billion. So, we are going to buy one heck of a lot of combat net radios, install a lot of TRI-TAC equipment and do a lot of other things just to give the Army a modern, reliable, tactical communications system such that when a brigade commander picks up the phone in the brigade command post, he can get through about as well as you're going to get through on the public switched network with reliability and voice quality that is just about as good.

McLaughlin: I realize that you're in a delicate position, but a number of our speakers this year have been addressing the topic of organization the Joint Chiefs of Staff (JCS), and various and sundry

changes that have been proposed. If you had your druthers in a perfect world, would you like to see that pushed one way or another?

Latham: I'd leave it just like it is. I think that all the stuff I've read about the reorganization is way off base, giving the Chairman more of this and more of that. That is not the problem. Grenada is one beautiful case in point; Vietnam is another, probably much more so because we were there so long. In my judgment we didn't have the political courage within the military, when we look back at Vietnam, to put together the right command structure because of the politics, the tugging, and so on. We didn't really apply the unified command theory that we had at our grasp in order to make the thing work. If you look at Vietnam and the command structures of the Air Force and the Navy and the Army, it was a nightmare. We had some things that were being commanded from CINC PAC, some things from MACV (Military Assistance Command, Vietnam) in terms of air support, and North Vietnam air support was commanded by two or three different guys. So, the Chairman could have had all the things in the world provided in this bill or any other, and it wouldn't have changed that situation unless he had the courage to go make it happen and fight down the politics of each of the individual services.

And if you carry through and think about the illogic of some of the things that have been proposed, like moving personnel with experience to the Joint Staff, it becomes absurd. For example, take a mid-career officer who has had experience in flying helicopters around in the Navy, and assign him to the Joint Staff for the rest of his life, and he will wear the so-called purple suit, he will forget everything he ever knew about allegiance to the Navy and all of that and become a nuclear war planner in the Joint Staff. And he never goes back to operations again, and for the rest of his career until he dies, he's in the Joint Staff arena. That's one of the proposals. I think it's crazy.

The Chairman's got all the power he needs. He really does. They say he doesn't have any staff. That's nonsense; he's got that huge staff supporting him. It's just a matter of using the Joint Staff and having the political courage to make the hard decisions, so you don't bring everything down to the lowest common denominator, which is what happens down in the "Tank" almost every single day.

McLaughlin: Well, let me pursue that for just a moment because I think a lot of people would describe the Vietnamese situation the same way as you did, as well as elements of Grenada or the Iranian hostage rescue mission, or other incidents — they keep recurring. If granting the Chairman more power isn't the answer, what is?

Latham: Well, I think it's a combination of things. One is what we have in both OSD and the Joint Staff — an incredible bureaucracy. The Joint Staff is limited, theoretically, by law, to some 400 people. Yet thousands of guys are supporting the JCS down there. And the Chairman has agencies all over the place to support him. So, we've got this incredible swollen bureaucracy, number one.

Number two, everything has some sort of a resource implication or perk implication, so the simplest things take years to get through the system. Required operational capabilities (ROCs) that are sent in by the CINCs to make improvements, presumably to their C³ in the forces, have sat in the Joint Staff arena trying to get through the wickets they have to go through to get "validated" for two years. Yet we know that ROC is an obvious need; everybody agrees to it, and so on. But we must "validate" it. Until it's "validated" we can't put any money against it. As a result, things slip for years. One of the biggest reasons we haven't fixed a lot of things in my area is that we can't get the JCS to validate ROCs so we can allocate funds to them. And we have, I think, twelve ROCs outstanding for PACOM today, and Admiral Crowe* is beside himself. I hope he becomes Chairman; then I can go down to him and say, okay, Mr. Admiral, you fix the damn process, because it's the most bureaucratic situation you've ever seen. And so the first thing is to go down there and, frankly, kick some rear ends and take names — in fact, I'd get rid of about every other person.

You know how big the JC³S is? The JC³S does not include, under General McKnight, anything to

*Admiral William J. Crowe, CINC PAC at the time of this presentation; now Chairman of the Joint Chiefs of Staff.

do with electronic warfare; so, he really has a limited C³ responsibility, and has no I. Yet he has over 200 people on his staff. I have all of C³I, and I had, until this reorganization, 87 people. It's incredible. If you tell me to do it with 40 people, I'll do it with 40, but I'll tell you, we could probably get rid of an awful lot of action officers out of the service and staffs and business would get done much faster.

McLaughlin: How can the process be improved?

Latham: I don't know for sure. I can tell you that this past summer we had the new Joint Resources Management Board, the four-star vice chiefs, address certain issues. On some of the issues they came out just exactly as one knew they would: If the Air Force didn't want this, the Air Force wasn't forced to have it; or the Navy, or whatever it was. The lowest common denominator came out. In fact, some of the work they turn out is very poor because they don't really want to get down and address the hard issues. And I don't think what is done to the Chairman's position will fix that. Somebody from OSD is simply going to have to go to work on the whole Joint Staff, no matter how much they object.

Student: What's the duplication between the JCS C³ Systems Directorate and your office, and is there a trend toward more centralized control?

Latham: Well, there is not a whole lot of duplication because I tend to have a technical staff and JCS C³ tends to have other types of professionals — mostly military. Actually, they added some 45 people to the Joint Staff this past year to do resource programming and analysis. Those are guys with green eyeshades looking at programs and adding up dollar figures and all that — to support the Chairman so that when he goes into the Defense Resources Board (DRB) he's better prepared. Forty-five people! The Joint Staff has tended to get into the design business; they've tended to get into the resources business; they've tended to get into the programs business. What they don't do well are two things that they're supposed to do — planning and requirements. And we keep saying, "Until you do that, why are you messing around with this other stuff?"