a sea-control ship with enough space for 17 aircraft - helos and Harriers - you get the capability to have constant airborne detection from your helicopters and a quick reaction from your Harrier very cheaply.

R. Are they hard to fly? Is there a personnel problem with that?

Z. No. They had no difficulty landing and taking off in fairly vigorous seas.

R. But it's not hard to get aviators who can drive them?

Z. No.

R. O.K. That's interesting.

Z. The LAMPS is a light airborne maritime patrol system, I think. I'm not positive, but it's a helicopter. And it's a detection device ...for detection of submarines, for detection of incoming aircraft, and for the sinking of submarines with a Mark-46 torpedo.

R. For detection and . . . Is this a big deal or ....

Z. Yes. Because we were using existing helicopters in the first generation the SH-2, and that gave us the capability to part of it additional protection to sea fairly rapidly.

R. Has a new helicopter for this purpose been developed?

Z. There is one in research. It will be a number of years before it is developed.

R. The option of the CV concept is obviously crucial. Right?

Z. Right. And that's the business that as you went from 24 to 12 carriers making each carrier capable of either projection or sea-control.

R. How much do you lose in either kind of capability by this double purpose?

Z. You don't lose anything with the changes made within the ship itself. You lose some strike capability by replacing some of the strike aircraft - A-7 - with S-3, ASW aircraft.

R. S-3 is the ASW. That was when you took over. That was already being produced?

Z. No. It was about to be produced. All the preliminary work had been done.

R. You also changed some of the anti-submarine carriers - you put attack components on them.

Z. That had been done during the Southeast Asia war to convert a CVS to a CVA, but this program called for making every hull that we had surviving capable of being a CV rather than an A for an F.

R. What do you have to do to a carrier to do that? Do you have to change the hanger deck and all that stuff around?

Z. You have to install something called an , ASW Command and Control

System Communication, and the capability to repair that kind of aircraft.

R. Yes, I see. You have to put in different spare parts, different mechanics, different shop tools, and things like that. Why does it cost so much?

Z. That's the $_ 75,000 - you spill that much every day.

R. That's considered right cheap.

Z. Yes, that is. For example, that about one-sixth of the cost of one of the S-3 aircraft that you're going to put onboard.

R. Which is fairly cheap. S-3s can live side-by-side with F-14s?

Z. Can operate? You can operate them both from the same carrier. As a matter of fact, the ideal configuration for the first phase of the war, you'd never have enough aircraft to do this, but if you could put half F-14s and half S-3s on every aircraft carrier at the start of the war you'd have lots of air defense capabilities and lots of ASW capabilities to get control of those seas, and then go in to attack.

R. Has roughly the same numbers of aircraft, no matter which kinds you have?

Z. That's right. To some degree. Roughly the same.

Z. This was the interim configuration of the Guam to test it out as a sea-control ship.

R. Oh, well. So that was important, too.

Z. That's right. And it turned out to be the thing that generated the data that my associates and I thought was overwhelming to support it, but could never convince George Mahon, who was constantly getting poisoned by Rickover, and who asked Stennis to support him on that in exchange for favors that Stennis would do for him. I mean vice versa.

R. Shockingly ...how those Congressmen carry on. Guam was not in that at the time ...at the time of Jordan, Guam was still a...

Z. ...an amphibian ship and we had a real wrestling match to get it away from the Marines. Chafee was willing to work it out with me, but when C came in he wanted it back right away.

R. Hansels? . . Division . . .

Z. That was done. That was not ..... we ended up settling for the SH-2 aircraft, so that one .....

R. LAMPS is a system, not a plane, right?

Z. Helicopter system. And we wanted to use SH-2s immediately and then to start the development of first and interim and then a long term. Finally, before we got through we ended up cancelling the interim, and going directly to LAMPSs-3, which we won't have for years. This was the destroyer-anti-

submarine helio - an un-manned helicopter. A drone should go out - it was kind of a failure - and it was tried ten years ago and has gradually been phased out.

R. You don't think much of that. E-2 C's are what?

Z. Those are aircraft that have a tremendous amount of detection and command and control capability. They are used to pick up the enemy aircraft and to relay the picture of the whole area back to the ships.

R. The carrier aircraft?

Z. Yes.

R. You only have a few on each carrier?

Z. Yes. Like one or two on each carrier, and they're your long-range eyes and ears.

R. Is that a big deal?

Z. No. It was just to speed it up because it would look like it would have high payoff for fairly modest cost at that point. That was done - it was a minor thing.

R. VE as a . Is the VE 1052 a new fairly ?

Z. It was that very controversial class that Mr. McNamara insisted on - it only had a single screw and only, in theory, 28-knots capability. In

actual fact, turned out to be that 98 per cent of the time it can keep up with the carrier and we only had to tow two of them back into port out of hundreds and hundreds of voyages, so that we're getting by fine with this .....

R. Well, McNamara was right about that one. It was no F-111.

Z. And the patrol frigate carried on his concept of the single screw...

R. Isn't that presumably disaster in terms of maneuverability and all that kinds of stuff?

Z. Every seaman would prefer to have a single screw because he can show off a lot more. But when you ask yourself is it worth the additional cost to the country, then not.

R. You mean, every seaman like that doubled, twin screw. Isn't there also a theory about just the importance of redundancy in a combat situation?

Z. That's right. And we examined literally hundreds of wartime cases and found that the number of times when the extra screw was utility when you didn't have something else so debilitating that you had to tow anyway with minuscule.

R. This mean that it has only a single boiler and single engine, too, or does it have redundancy there?

Z. It does have some redundancy there.

R. Anyway, they carry planes - they carry helicopters.

Z. It was an important thing to do. It improved the capability, but it was easy to do and not controversial.

R. UH-2 is a helicopter?

Z. That's right.

R. How many different kinds of helicopters does the Navy have, do you suppose?

Z. Oh, I suppose 8 or 10, but the only important ones are the SH-2 and CH-53s, with all kinds of minor miscellaneous one. I'm sorry, there's another important one too, the FH-3, which is used on board carriers for rescue work.

R.

Z. No. 17 - additional R&D dollars for SSN, for destroyers, patrol aircraft and carrier ASW aircraft communication. That's in order to make it possible for the submarine to communicate with other kinds of ships, and that has turned out to be a useful kind of facility to have.

R. But it wouldn't be one of your things?

Z. Potentially, it could be. We haven't yet reached the point where we

can conclude that. It would make it possible for the nuclear submarine to escort carrier task forces - communications is the weak link. You can't him what you're doing, where you're going, and so forth.

R. Would this have any affect on greater accessibility to command and control by the strategic submarines, or is that another story?

Z. Yes. If you could improve communications this way, you could always have aircraft out circulating.....

R. That is one of the things that critics of the SLBMs talk about.

Z. That's right.

No. 18 - increased funding for torpedo counter measures. Not too important.

No. 19 - increased funding for radar and acoustic deception devices. Very important - very low costs - not enough progress during my four years.

R. That is right. Well, what was the hangup about progress on that one.

Z. No union.

No. 20 - additional research procurement in communications. Again, very important and not enough progress - Russians are still well-ahead of us - made some progress.

R. Does that mean that the R&D was .. is this funding, non-funding - or is it just people not doing very well?

Z. Here there was, I think, high recognition of the need. You just couldn't free-up enough money in competition with everything else.

R. Spare parts - Housekeeping -

Z. No. 21 - it was very important to improve the readiness of ships, and as you have seen in the Jordan crisis, we had very poor readiness, because of inadequate funding.

No. 22 - accelerate procurement of point and close-in weapon systems - That's the ones I've been talking about - modern equivalent of the old 40-mm to try to shoot down cruise missiles.

R. And you thought a lot of that one.

Z. Yes, and Congress cut it back each year because they weren't convinced that the program was ready to move. My theory on this was that each individual unit was so low cost that you ought to go ahead and go all-out to try to get it because of the very high pay-off. It would be different than deciding to buy a billion dollar Trident submarine when you weren't very sure of it. This was a one- to two-million

dollar a copy unit, and each one could make a significant contribution to defending the ship.

R. Well, are they deployed now?

Z. No, they're still not deployed but they're still moving along through the system. My successor's successor will probably get them.

R. That long, huh? But then this was something that was already in the R&D stage when you took over.

Z. Yes. But/not vigorously supported as a policy matter.

R. But with changes that you pushed.

Z. It's further along than it would have been.

23. Personnel -

24. Again for personnel -

25. same

R. Why the decision ?

Z. 'Cause it was already being done.

R.

Z. That was approved right away as a matter of principle and worked while General Chapman was with us, General Cushman made it harder to keep them.

They were always eluding us.

R. Actually, he didn't like them very much.

Z. He wanted his hot, little hands on all his gear.

R. They were really under the operational control of admirals .....

Doesn't sound like a major issue ...big one ....What does OV stand for?

Z. Overtaken by events - it had already been accelerated probably by that time.

R. . . . . much less them using off-the-shelf hardware.

Z. In other words, while you're waiting for Harpoon to get an interim capability by installing surface-to-air missiles in boxes to be launched against ships up to the horizon range. . .

R. That was always an easy one to slow down.

Z. That's right. That they'd approve generally while not approving the trade-off.

R.

Z. That's a very sophisticated attack aircraft - that was A-6E - it carries a lot more electronics so that it can do a much better job of bombing at night and in bad better than the A-7 can.

R.

Z. We tried to have 12 of those on each carrier. That gives you your capability to strike at night and in bad weather.

R. That 14 is really a defensive one.

Z. You can use it to strike but it is a very expensive thing to do if you lose it. You want it to send your fleet into convoy.

R. Reduction in the CBs....

Z. Because it was just manpower . . . . . give you some dollars . . . looking for ways to get a cheaper ASW capability... nothing ever came of it much - increased research procurement for electronic warfare - we knew we needed to do better, lots of money has been spent, but we haven't moved the process along very far yet. This is one way of getting an interim SSN capability and improved sensors for helos is modest, not major.

R. Here we are on this one; this is another one that you're fond of.

Z. .....it's for my successor, four times removed. It is important and we got the first prototypes operating on my watch and we got the money to buy the .....

end side A