

CUSHING INTERVIEW - BRIEF TOPICAL OUTLINE

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CHARLES CUSHING (8 MAY 95)

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Interviewed by Arthur Donovan and Andrew Gibson

Arthur Donovan: We're here at Charles Cushing's office in New York, Mr. Cushing, Andy Gibson, and Arthur Donovan, talking on the 8th of May.

CC: I'm sixty years and one day old.

AG: No kidding, really.

CC: So, yesterday I had a surprise party ...

AD: What's your project at Wales I hear that you're doing?

CC: My project at Wales is, or the dissertation is, in a subject called ship acquisition, which is really a process for acquiring ships -- a more formal process than most people follow. There are a lot of organizations, both nationally owned shipping lines (especially in developing countries) or shipping companies, entrepreneurs, [that] go about spending a hundred million dollars, two hundred million, or five hundred million dollars with less care and formality than you'd put into buying a color TV set or a new car. And all I'm trying to say is that if you're going to commit your company or your organization to 20 years of servitude, you'd better follow a proper process for doing that.

AG: I'm surprised you've been so long because you had a great book...a talk from it. It was just a typed talk. But you had that years ago.

CC: Well, what I found out is, you know, it's one thing to expound, as a consultant or as a professor, and it's another

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thing to do something in a learned way. And what it has caused me to do is to go back and, you know, document, and King [Head, Department of Marine & International Transport, University of Wales, Cardiff] has said to me, "You know, you can't just talk to us like you're a consultant: 'It is because you say so.'" And in the meantime I'm trying to run a business, and run marathons, and run a lot of other things.

AD: Oh, you're a marathon runner too.

CC: Thirty-seven marathons. The last nineteen, although I have to confess I dropped out of the last..I dropped out before the race actually started for medical reasons on the last one.

AD: Did you run Boston? Or do you run Boston?

CC: In my youth....

AG: You were an engineer?

CC: I was a deckie. I sailed on deck. I have a deck license, not an engineer's license.

AD: Well, tell us how you came to Sea-Land.

CC: Well, it became a second.. [I owe] my job to the New York Times. After I got out of MIT.

AD: And could you sort of give us a year, just so we can get ...

CC: Okay, so. Kings Point..well, let's go back three steps before that, all right?

AD: Fine.

CC: Let's go back to the Saturday Evening Post when I was twelve years old. And I opened the Saturday Evening Post and there was this article about Kings Point with a picture spread across two pages. An aerial view of Kings Point and then the article about what a great school it was. And then at age twelve I said, "That's it! That's what I'm going to do."

AD: Where did you live?

CC: I was..had just moved to New York from Detroit. So, that was my goal. I got out of high school, went through public schools on the lower east side of Manhattan here where my

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schoolmates were--what's his name?--Bernie Schwartz, a/k/a Tony Curtis. Walter Matthau and Zero Mostelle. Those were schoolmates, not classmates. But at any rate, I got out at age fifteen. Had two years to kill because seventeen was the entrance age for Kings Point. So I went to sea for a year on Danish ships from South America, Southeast Asia. And a year at City College preparing for Kings Point. And then four years through Kings Point Deck, as I said, because I had the feeling that there was--and this kind of leads into I know the subject you're interested in--I had the feeling, even at that age, that there were a lot of engineers working on propulsion and steam plants and machinery and so forth, and to improve..to make any kind of an improvement in the area of machinery--or propellers or hull form--was going to be very, very tough. If you could improve the steam plant one percent, you're up for the Nobel Prize for engineers, if there ever was one. There wasn't. But on the other hand, in cargo handling, especially as a cadet sitting in cargo holds in South America and Grace Line ships that you knew well, and watching the way they handled bananas or whiskey runs for North, Northern Europe ...

So, it became obvious, watching the way cargo was handled, and so forth, that there were tremendous improvements to be made in the cargo handling side. And so for me cargo became much more interesting than certain machinery aspects of it.

AD: May I just ask, was this your own perception? Or was this a view that others at Kings Point and in the industry had?

CC: No, I don't think so. I mean, we had [?] out there at the time, he was one of my instructors. O.D. Cullivan [?] and the ICHA Group had just formed just then, and they were ...

AG: That's the International Cargo Handlers Association.

CC: ICHA ... They were just founded just then and I was terribly interested in what they were doing. And I'd written some cadet papers and won a prize on cargo handling, and things like that. Cargo to me was a fascinating subject.

AD: But other people were focusing on this at the time as well?

CC: Very few. Solivere[?] was one. He had a passion for it...John Modage, who had written a book on trim stability for ships ... standard textbook, and which is still around; it's in several later editions now. But there's a standard book for, you know, loading and stability of ships. They were my two more interesting instructors out there. And they..you know, you can't help but pick up some of the

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enthusiasm of people who are teaching.

AD: Well, I was just sort of fishing around to see whether containerization picked up on the notion that, you know, there had to be some improvement in cargo handling ...

CC: Well, there was no containerization in those ...

AG: Forklift trucks and the pallet. . . that was a breakthrough.

CC: These were the years 1952 to 1956 and then I graduated from Kings Point and went to Port Freeless [?] ... sailing on the America as a Third Mate, and then..and I was anxious to get on the freighters and the Mariners which were going out to the Far East. And I considered myself lucky, but I had made application at that point to MIT, and attended the next year, '57. So I went to MIT from '57 to '60 ...

A lot of people went through the management ... So I had to start from ground zero from an engineering [perspective], although I'd taken an engineering course at Kings Point with the engineers. It was a grim experience up there, trying to be in the graduate school on one side and then to take a lot of basic undergraduate courses, three years of going to sea in the summers to make enough money for tuition, sailing with Isthmian and U.S. Lines and working in between ships; to go to the Union Hall once a week and, you know, keep my card current so..and ...MM&P [Master's, Mates and Pilots Union] ... some pilots to keep my current at the Local 88 office over here on French [?]. So I worked summers and sailed, and then I night-mated. Night mating..I'm sorry, I don't know your background, so ...

AD: Well, I've been teaching at Kings Point for seven years, so I've picked up much of this.

CC: What do you, did you, have you, do you have a nautical background? Seagoing background?

AD: Not really. I was in the Navy and my father was a career naval officer.

CC: The U.S. union regulations require that steamship lines hire shore-side engineers and shore-side mates to come aboard ship when U.S.-flag ships were in U.S. ports, so that they, the deck officers and engine officers could go on day work and then spend an evening ashore. And so these night mates and night engineers would come aboard and load the ship and run the ship, and so forth. So night mating was a way of getting through MIT also. And in the course of part of

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that, I took a spring vacation and managed to throw in my killer card at the Union for a trip, a coast-wise, couple of coastwise trips on a ship called The Gateway City in 1958, which was a year after the ship was put in service. So it was like a brand new operation, and I became ...

[Gateway City was] one of six. When Malcom started he started with his three tankers, the Ideal X, the ... and the ... And they were just T-2 tankers, still with their spar decks on them, the spar decks being decks that were used during World War II to transport airplanes across the ocean. And they left them on some of those ships, and he acquired them, I guess along with the Pan Atlantic Steamship Company, which in those days, in those years the ICC--the Interstate Commerce Commission--I guess ruled coast-wide shipping the way they ruled trucking and railroad. And so you had to have coastwise rights to ... so he bought the company and had these ships. And he carried thirty-three foot long containers built by ... At that time, thirty-three foot was the longest highway ... And it soon switched to thirty-five by 1957. He took six of the Waterman ships and converted them down at Mobile Ship Repair in Mobile, Alabama. And it was George Constantine [?] who headed up the effort in the shipyard working with Boozy Campbell and Bobby Gottlieb and Jimmy Ewing, who were engineers down there, to develop the cranes and the systems, and then with ...

Uland, Campbell and Gottlieb, which was the name of their consulting firm, they were all Auburn graduates, Auburn University. And they were Mobilians, although Jimmy lived over in New Orleans. He was a civil engineer and later taught civil engineering at LSU. But Bobby Gottlieb and Boozy Campbell were, in fact, aeronautical engineers at Auburn. And they then switched to mechanical. But they knew electrical and hydraulic and ... they were really geniuses.

AG: They knew cranes inside out by the time I ...

CC: So they were hired, really, to do the cranes, and Keith Tantlinger who I call a real genius and a whiz. If we had to go back selectively and take the real geniuses in the system ... Of course, a lot of people called Malcom the genius. But he had some very talented people ...

AD: Sounds like his genius was getting talented people around.

CC: Well, he had the vision, he was a visionary, too. But Keith Tantlinger, who is still alive and I still correspond with and we're still working on some projects ... Later when he

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left and went to Freuhauf and he developed the BART car system out in San Francisco and he worked in southern California... he lives in southern California. His family, he's originally a Californian. They own avocado groves out there, and with the price of avocados I assume he's a multi-millionaire. But at any rate, Tantlinger was the mechanical genius in house, devising cell guides and devices for flipping containers down, and the corner casting, that whole concept of the twist lock and different arms and all this kind of stuff was Tantlinger. So you had this little team of Tantlinger and Campbell and Gottlieb and Jim Ewing and a few others in there, that put the Gateway City, six Gateway Cities together and started in '57.

AD: Could I just ask..technically were they doing it strictly from the drawing board, or were they adapting existing systems?

CC: No, they were ground zero. Tatlinger is a really very basic ... I was fortunate enough to see a lot of his original hand sketches and it astounded me that he was able to sit down and sketch up some of these concepts from scratch. I mean, the original ... He got it almost right from the very beginning, instead of having to go through a whole evolutionary thing, or taking something into ...

AD: So it's not something that comes out of trucking or out of trains.

CC: I mean there's no question, there's no question that Malcom from the 1930's, from a high school..from his high school days, was involved in trucking, and understood trucking. And understood, you know, the mechanics of, and the system. And McLean Trucking had been built to the second biggest trucking company in the country by the 1950's. There's no question that there were Conex boxes around and Dravo vans, I mean, we had those ...

AG: A Conex box was developed by the army, and that was 350 cubic feet. It was such that if you got about twenty strong men I think they could pick it up. And it was all steel coated and you handled it like conventional heavy lifts, you know, which all the ships could handle, because it didn't weigh that much. And there were lots of Conex boxes, and we used them ...

CC: Thousands.

AG: ... for cargo security. We put highly pilferable cargo in them.

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CC: I think that's why the military..in my early seagoing days, which is the early fifties, and certainly even before then in the late forties, once..you know, once the war was over, I mean, we were shipping a lot of cigarettes overseas. And the safest way to ship cigarettes..and a cigarette--not a package, but a cigarette--had such value overseas in terms of bartering power and things like that, that it was tough to keep cigarettes from being pilfered. And I have a feeling that one of the things that stimulated those Conex boxes was the transportation of cigarettes and whiskey, and some of the other ...

AG: That was actually true, because we were shipping a lot of cigarettes to South America. And in fact it was one of the first intermodal applications, because we sent the Conexes down to Virginia and they were specially fitted so that there was a skin inside. And then they put shelves in them. They were removable so they weren't crushing. And they were loaded at the plant. I forget what the company was. I think it was Liggett Meyers, and brought up by truck, and then sealed. And that's how they went to LaGuira ...

CC: Yeah, these boxes were like about six foot across by six foot by five ... You know, they were pretty massive things, not something that somebody would go and pick up and take away and steal. They were made out of steel ... and they had a plug in them, or a door in them, and it was pretty tough to get in them. So they were security vans.

AG: Yeah, exactly.

CC: And that was what we'd use these boxes [for]. And then a company in Pennsylvania called Dravo came along and they started building a bunch of these. And, we're talking now in the nineteen..at least to my experience, was in the fifties.

AG: Could I have you check one thing about the genius of Tatlinger? Now, you've got a truck body which is basically a fairly fragile thing, because they're all aluminum to a steel corner post and what have you. To make it work, he devised a cell guide. But to stack these sons of bitches six high, okay? Of course, they're much higher now. But six high! And so, all the strength was in the corner post. It was stacking corner post to corner post. And then the other thing, of course, was that this twist lock he talks about..you know how that works. Well, the thing was again..now this is where Malcom's genius came in; they had developed the twist lock. We were going head-to-head with him at Grace and we have a sliding wedge, it's called a

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national speedloader system.

CC: Yeah, right. And it was put together by a company out in Ohio that later moved to North Carolina.

AG: Exactly. That's the system Grace was using.

CC: Yes. And that national speedloader system really came out of the railroad industry. What it was was a series of couplers, if you're familiar with railroad couplers, where you could push one railroad car ahead, and there would be a receiving, a female receiving part that would accept the male part that was the sliding portion. And it had angled faces on it that would slide into the female part, and once inside it would lock inside.

AG: It's the standard coupling in rail cars ...

CC: And so what somebody said is, "Why don't we just turn that vertically and we can have then a lifting system?" And so there was a major investment made in this speedloader system, national speedloader system.

AG: You see, we were, other than Sealand, Grace was the only company that had an extensive container system. We had seventeens and thirty-fives.

AD: Give me a year just for reference.

CC: Fifty-six, fifty-seven.

AG: It was contemporaneous with Malcom's efforts. And the Maritime Administration kind of liked the Sea-Land system, which would have obsoleted ours. We had a pretty big investment in this stuff. And so, I was..well, I was very familiar with all the operating guys. And so I got all my buddies--because they didn't have any investment at all--to say that this was the better system, okay? Just to be nice to me. But I went down to MARAD; I said, "All your ... constituents want this system. You can't back the other one." And Gulick was the guy then; he was really pissed because ...

CC: Oh, yeah. He was out to torpedo Sealand and ...

AG: And so, but the catch was--as I say, this is Malcom's genius--this outfit in Ohio wanted to charge a royalty, I don't know, fifty cents, a buck apiece, for every casting. Anybody could make them, but they were gonna really make a fortune. Malcom says, "The hell with it! Anybody wants my

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system gets it for nothing!" okay? That's genius, okay? Because now he's got universal acceptance. It was a better system anyway, because to release that it had to be electrical ...

CC: Yeah. National speedloaders was a very complicated system.

AG: You went in like it was gravity and it locked. But to release that lock it had to have an electric connection ... which didn't always work, okay? I mean ...

CC: Maybe three-quarters worked and the fourth one ...

AG: That's right. So, there was..and he had a very simple, foolproof system. But the genius was, "I'll give it to you," okay?

CC: And so, well, he got sandbagged. He got sandbagged by this person in MARAD because what happened was Malcom had a keyhole in the top of the corner casting. He had a six-inch by eight-inch corner casting face, and the keyhole was exactly in the center, as you might guess, of that corner casting. It was three inches from the corner one way, and four inches from the corner the other way. So he offered his patents to the industry on a royalty-free basis, and I remember because..at that time it was called the American Standards Association, ASA, the American Group was ASA. You know it's on your camera, it says, "ASA", that was the American Standards Association. That group later changed its name to USASI, United States of America Standards Institute. It later changed its name to ANSI, American National Standards Institute, which is what it's called now, okay? So ASA had a whole lot of different committees on cameras, on frozen food packages, and everything you can think of. But they also had one on containerization, they had just started one. I'm talking now years 1959, 1960; I joined them in 1960 and they had just started. And they needed a sponsor and the sponsor was the American Society of Mechanical Engineers, who had a materials handling committee named MH5. MH5 took over the sponsorship of the container standards.

So we had these committee meetings, and Tant used to go to these meetings and the people from the trailer..Freuhauf and a whole lot of people. And they were immensely fascinating, and I still have my files going back thirty-five years of these. We had a meeting last week, for example, on this. And, of course, once we had a national position -- and it didn't happen in those early years, but by the middle 1960's -- the international arena had started to say, "We ought to

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have international standards, too."

AG: And this was the ISO, International Standards ...

CC: Right. So what we would do is we would send delegates and delegations from our MH5 group to the ISO and they established a committee called TC104, which still is in existence, which Americans had been the head of the secretariat for years--Vince Gray and before them, I can't think of his name now--all these people were interested in standards. But at any rate, in this whole standards effort they ganged up against Malcom, because they were frightened to death of him. In the beginning everybody poo-pooed the idea of containerization. But they started to get worried about him once he got into international trade and so forth. So they took his patents, royalty-free patents, and they moved, they changed the shape of the hole on the corner casting, and they purposely moved the hole a half an inch, which made obsolete all of his spreaders, all of his twist locks. It wasn't just a case of him then changing the devices..I mean, they weren't lined up properly. And it was a, I thought it was a not very kind move.

AG: But the reason for the hole was that initially, of course, so many of these things were handled conventionally. And so this had..you could put hooks in these holes, you know, and handle them like heavy lifts. And that's the reason the hole was in all of these, so they could be handled without spreaders or anything else. And the hole was important in the early days.

CC: So you had the keyhole in the top, but then you have apertures on the sides. And, of course, you have these fittings not only at the four tops, but you have them at the bottoms, too. And my recollection is that those holes in the sides, those apertures in the sides, were designed for a number 32 cargo hook. And, of course, most of the people at these meetings were truckers or trailer people, not marine people. But somebody on the waterfront had said, "You gotta handle it with a number 32 cargo hook", and so we had been searching for the last 35 years for a number 32 cargo hook. Nobody's ever been able to find one ... [laughs] ... Dan had one made out of plastic because he found it in a catalog somewhere, but nobody's ever found a 32 cargo hook. But even as of last week down at the American Association of Railroads we got into a discussion because they want to change the core fitting a little bit, and so forth, and make the bottom fittings identical to the top fittings. And the whole subject of the number 32 cargo hook came up again.

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AG: The other thing I might do.. they get in these committees and you could interject; as Charlie indicated, the standards that were set domestically were seven feet and thirty-five, and this was because thirty-five foot was the largest truck you could take through Pennsylvania. The railroad dominated the standards, and if you look at the map, like from Lake Erie to Philadelphia there's no way to get north, and that's where the consumer was. And so, for some reason--and you probably know what it is--just about this time the standard became twenty and forty.

CC: Yeah, that was about 1960 it happened.

AG: Well, because we were building the Magdalana Class Ship and the guy that we had, a fellow named Gilbreth, remember him?

CC: Oh, yeah.

AG: His father was the Gilbreth, "Cheaper by the Dozen."

CC: Oh, I didn't know that.

AG: That's right. Well, he was the son. And he handled all this stuff for us. And he said the standard was seventeen and thirty-five. But he says, "[it's] ... gonna be forty feet." Now, you're building a ship ... [laughs] ... the difference." And I think, I guess it was George Sharp, invented a sliding cell guide, so he made the compartments to take a forty footer. And, you see, the cell guides take no strength at all, they're guides. And so we had this whole thing in a frame and we had it made so that the container spreader could pick up the guide and move it from thirty-five to forty with very little effort, okay? And so he accurately predicted that this is gonna be the standard and we built the ship accordingly. These are the Magdalana class...

CC: Yes. But prior to this, and you can better describe this whole thing, but I know I inherited it when I was at Sealand..and I should say I joined Sealand then in 1960, late 1960, after working, coming out of MIT, going to work for this fellow Hank Teterman here in the city, who had me out on the West Coast flying hydrofoils and working down on the Brooklyn waterfront ... No, I guess that was summers with Liquifreeze ... using liquid nitrogen to refrigerate these little Dravo van type containers, and stuff like that. After working part of a year for Hank I decided, you know, that I really wanted to get into a mainstream company. And there was an advertisement in the New York Times for a mechanical engineer at Sealand -- at that time it was called

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Pan Atlantic Steamship Company. And I went after that job, but I know a lot of people competed for it, I remember. But I went after it ...

AD: This is 1960?

CC: Yeah, end of '60. And so I started over there. And so '61 to '68 is..January '68 is when I worked at..or the end of '67 is when I worked ...

AD: Who were people who were working at Pan Atlantic at that ...

CC: Uh, not very many. The office was at the foot of Duramis Avenue in Port Newark and we were in an old pineapple warehouse that had been kind of fixed up inside to look like an office. It was all very makeshift in there, and I don't know how many ... there couldn't have been a thousand people.

AG: But this is graduating because Malcom started with half of one of the sheds. Port Newark was a bulk cargo port, but on the Duramis Avenue side there were some World War I sheds that were developed a bit during World War I and then it went back. And he had one of these sheds where half the shed was his office, and the other half was an LCL where he would stuff containers. And that's where I first met Malcom, sitting in the middle of a bullring - no private offices, nothing, just this half the shed.

CC: When I came to work there they said, "You're gonna sit in this room here," and I would sit at this drafting table and people would come at lunch time and sit with me and eat their lunch and watch what I was doing on the drawing board. And I thought that was kind of friendly, but I never understood why and they never had told me. But I was actually working in the lunch room where the annex of the ... And about two weeks after I joined the company, Boozy Campbell had been hired on retainer. His firm--Ewing, Campbell and Gottlieb--were doing the crane designs and so forth and Boozy Campbell had been hired to form an engineering department. So he hired me to do the cranes, mechanical engineer. But I was happy to work as a mechanical..even though I was a naval architect. And a few weeks later he hired Ron Katims to do the terminal part of the work. So Ron Katims and I sat together with our drawing boards side by side. I worked for Boozy Campbell for a couple of years.

AG: Is Ron Katims a mechanical engineer or civil?

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CC: He's a civil engineer, Cornell, he went through Cornell. So, then we had a marine department over there headed by a guy named Nelson Rogers, Nelson K. Rogers, and he had his usual trusty four engineers and ... marine superintendent ... superintendent engineers and so forth. But it was a very small and very compact group sitting in this big, big area. We built an extension to it and then the Port Authority came to us and said, "We think you ought to be over in this big swamp over here. We're gonna create an area called Port Elizabeth City," where at that time they started to surcharge that area, pressing down and dredging and de-watering the area. And they built a terminal over right across the town line between Newark and Elizabeth, New Jersey, in the area called Port Elizabeth.

Which is not really called Port Elizabeth, and the reason I say that is because some nasty son-of-a-bitch got out of an airplane and got into one of those taxis that used to line up in front of Newark Airport, the old Newark Airport. And those guys, those taxi drivers would be waiting there for three, three, four hours, you know? And the shortest ride you could take would be from there over to the piers, just a couple of dollars ride. And this guy got in and he got terribly nasty from flying the red-eye or something..he got terribly nasty with the cab driver, and he said, "You're gonna take me to ..." and the cab driver was bitching and moaning, and he said, "You're gonna take me to Port Elizabeth." He said, "You wanna go to Port Elizabeth?" He said, "Yeah, I wanna go to Port Elizabeth!" "Okay, we're going to Port Elizabeth." And he got on the turnpike and after about an hour driving south, you know, to Port Elizabeth in South Jersey, which is right down near Cape May, the guy came to his senses and realized ... that the proper name of the place is..the Port Authority Piers, the New York and New Jersey Port Authority Piers, at Elizabeth, but we've always shortened it to Port Eliz... It's not really Port Elizabeth.

AG: The reason they were able to build it is this was before the environmentalists ... The Port Authority ran a pipeline up to the middle of New York Harbor, where there was a huge sand deposit, and they sucked a hole you could stick the Empire State Building in, and, you know, then built this up about ten feet high ... you couldn't do anything like that today. Plus the fact that he had..it was incredible because I saw the plans. We were in Port Newark and a fellow named Lyle King who conceived a lot of this stuff. And he had the..and I said, "Gee, that's not a very big port." And he said, "Ah," he says, "That's just to get the approval. We're gonna do this!" ... And that's what they did. And

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they knew just..the thing they got through was a relatively, kind of like Port Newark thing. And Port Elizabeth is half again as big as Port Newark.

CC: Well, that was the style of..who was the guy here in New York that did all of the parkways and parks?

AD: Moses.

CC: Yeah, now, Robert Moses, when he built Jones Beach, you know, all he asked the state legislature for was enough money for a sidewalk and a parking lot. And he knew that once people could get out there and park, they'd have to go to the bathroom, they'd have to change. So everything would come after that, see? And so, once he got his nose under the tent, you know. And I think Lyle King's approach was the same way. And so that whole Port Elizabeth Port Authority area just grew rapidly.

AD: I'd like to put a question to that, because they built this big, new port, and they were making a commitment to containerization very early on, it seemed.

AG: No question about it.

AD: And was this a ploy on their part to create a new business or to capture the shipping business in New York Harbor?

CC: Both, both, both. I mean, one would have to realize that in those years..all right, those were the breakbulk years, and most of the transatlantic operators were still saying, "You can't containerize but a small percentage of the stuff that moves on the North Atlantic." I mean, it was really ostriches putting their heads in the sand, U.S. Lines ... , saying, "Oh, it's only ten or twenty percent of the cargo that's gonna be..." And there were reports around in nineteen--dated '60, '61, '62--that say that containerization is just a niche business, and so forth. So, if you have to, if you think about that era--the fifties; well, right up to the late fifties--the cargo really moved through the port of New York on the West Side Piers, on the Brooklyn Piers, some of the East Side Piers here. But if you looked at Pier 57, Pier 58, Pier 59, 60, 61, 62, the U.S. Line and Grace Line Piers, and some of the fruit piers downtown here, I mean, it was a nightmare. I mean, there would be trucks backed up for days, it seemed like, up on Eleventh Avenue, on the side streets, to get out on the pier. There were Coopers, there were Shenanagos, there were draymen [who] discharged the lighters.

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AG: The Shenangos, I guess, came down from the Shenango Valley in upstate New York in the spring, and I guess originally worked the lighters. That's the only thing that would account for the name.

CC: But there were thousands of people out on these piers, you know? And, you know, they would shape up and the longshoremen would come down and there would be gangs in every hold. And there were hordes of people working on these piers to move a very modest amount of cargo. And it was just a horrible..logistically, you know, industrially, in every possible way.

AD: But that was not under the supervision of the Port of New York ...

CC: No, it was the Department of Marine and Aviation. New York City's Department of Marine and Aviation was very bureaucratic, very typical. So that if Andy would come along now and he would want to start a new shipping operation, he would go to them to get pier space. And they would say, "I dare you to try to get pier space from us," you know? "I dare you to try to break into this." And, of course, hands would be out and god knows what the graft would be. And then he would have to deal with the labor and everything else. On the other hand, you had this group called The Port Authority which was aggressive, young, new, looking for new areas. They'd started with the Holland Tunnel in the twenties and thirties, but they gradually moved to the airports. And now they were looking at cargo. And they were completely the opposite. They were pro-active rather than reactive. They would say, "... there's Andy Gibson. I'll bet he wants to go in the cargo business. Let's research Andy Gibson. Let's look at what his cargo needs are. Let's see if we can go encourage him. We'll arrange the financing. We'll go to him with a complete package." And so the Port Authority was out very actively looking at new virgin lands and area, looking at people like Malcom McLean and others, saying, "What can we do to attract them to these areas to develop ports?" So it was like a completely different approach to port development than this bureaucratic Department of Marine and Aviation. And New York really shot itself in the foot, they could have done a lot to improve the city. I mean, the Brooklyn waterfront, they tried to re-develop that late. It wasn't the best place because it didn't have rail heads, and so forth. The West Side of Manhattan was a disaster from a cargo-handling point of view, and so forth. Staten Island, nobody even thought about using Staten Island until it was too late, and so forth. So New York City really had a bad situation,

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didn't try to improve it, didn't care. And the Port Authority, on the other hand, went at it very aggressively.

AG: As you say, they were tremendous. They had a marketing force, remember Bill Augustinus?

CC: No, I don't.

AG: He was a marketing guy that must have called on me every six months, regular as clockwork, okay? He identified who was probably going to make the decisions, they were generally operating people. And as he said everybody thought this was crazy. And we had the Magdalana on the drawing boards. And that was a really unique ship, a transitional ship.

CC: But what I was gonna say earlier, because I said I thought that you could really do more to fill it in, was that Grace Line had thought about containerization early on. And to leave Grace Line out of any discussion of who the pioneers were is really a disservice, because their misfortune, I think, was that they had planned a service from the East Coast of the U.S. to Venezuela. And the unions..and I can't say that anybody in those early days was--I'm talking waterfront laborer, longshore laborer--was thrilled about the idea of containerization. But the unions in Venezuela, as I understand it, were extremely militant, and absolutely point-blank refused to discharge the ships.

AG: Well, in retrospect, there was a lot of arrogance on our part. We had an executive vice-president, an extremely smart, able guy, but arrogant. When he left us he became Geneen's executive vice-president at ITT, he was that caliber. And he determined..it was a guy named Ted Westfall.

END TAPE 1, SIDE A. BEGIN TAPE 1, SIDE B

AG: I think on a Sunday in La Guira they got six times the basic rate per ton of cargo and at night, okay? But they very quickly went into treble time ... pay them by the hour. Well they said, "You ain't gonna pay us by the hour." And, of course, what he told ... tough as the longshoremen were, we were competing with Venezuela Line, which was a big line at that time; Alcoa, Ned Lloyd. And they didn't want any part of this... there's no way, there is no force. And, of course, they kept wanting breakbulk ships for Venezuela, and that container ship sat there ... Westfall was determined that that ship would wait..it stayed there for eleven months. What they had done was they took two of the ships in their fleet ... the C3's.

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CC: I thought they were C2's.

AG: No, they were C3's, because they made a better container ship. We had on the West Coast the ... The San Eliana and the Santa Leonora were the two ships.

CC: I'll bet you a nickel there were C2's but ...

AG: You'd lose your nickel ...

CC: Okay, when you know..that's what I say ...

AG: Because there were tons of C2's and we only had a few C3's.

CC: Because what happened to the Eliana and the Leonora ... Yeah, when they got hung up in this operation and they never really were able to do the thing they were supposed to do. And they had been set up on the seventeen and a half foot container sizes, which would couple..which would marry together to form a thirty-five footer, so there was compatibility between their seventeen and a half foot ...

AG: We had thirty-five's also.

CC: and the thirty-five's that Sealand had. The ships became very desirable to Sealand when they were on the market, so Malcom worked out a deal, I guess, to acquire these two ships.

AG: Yeah, he paid off the CDS [construction differential subsidy], the remaining CDS, because this wasn't controversial; nobody cared. This was a stupid system. "Ha, ha, ha! Look at that stupid Grace Land!" ... We were just delighted!

CC: So we took those two ships down to Alabama Dry Dock, where..and I'm talking about the years about '62, I guess it is. We took those two ships down there, and Malcolm had intended to operate those out of Mobile and New Orleans into the Puerto Rican trade. And he was going to serve not the main port of San Juan, but he was gonna serve Ponce and Mayaguez. So rather than reveal where he was gonna sail those two ships by naming them--'cause he used to like to name his ships after the ports--temporarily we had to name the ships the Sea and the Land. And that's where the names of the two ships ... After we... Eliana and Leonore, and we put Sea and Land on them, and we converted them down there, knowing that they were gonna ...

AG: How much conversion did you do?

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CC: A lot! We had to do a lot. Well, first of all we had to pull the cranes off them. They had those sea cranes ...

AG: But you kept ...

CC: No, we scrapped those, because they ... You had cranes on them, because ...

AG: Yeah, we used to break into new trades because those were very good. In those early days, we'd put ship-board cranes on everything.

CC: Okay. And so we had built some, at Avondale and the gantries, and we built the trollies up at ... Skaget Iron Works and ... Washington [?]. And we had to change the hatch covers. And it was a lot of ... mechanical work. But we called them the Sea and the Land. And then finally when the ships came out we called them the Ponce and Mayaguez. And the Mayaguez is the famous Mayaguez of the Mayaguez Incident down in, off of Thailand, where the pirates ...

AG: Just finish up that, on the subject of arrogance. We had the Magdalana class, four ships coming along with a lot of containers in them. By then all of the extensive banana compartments..everything was on pallets, okay? There was a lot of palletization and they were kind of the first Ro-Ros; they were running automobiles in there, the whole thing. We went over to Newark because we could do anything we wanted over there. The labor was so ecstatic to have the work, there was no problem. But when we went to South America-- Westfall had left by this time--and we put a guy in charge who spent years in Chile--he's an American--and he really worked all the ports. And we realized instead of screwing around with the labor, pay them the way we always paid them, because you're gonna get it back in vessel turnaround time, okay? We turned those ships like crazy. And they didn't object to that, because we hadn't screwed up their basic system.

AD: This was a later generation of ship?

AG: That's the ship..well, we'd already sold these ships, the Eleana and Leonore were now failures. We sold them to him - I probably told you this story, but we went over to U. S. Lines and tried to do a joint deal with them in the North Atlantic.

CC: No.

AG: We did. Because we recognized we couldn't get them there.

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So we went to U.S. We had these two ships, we've got three sets of containers for the whole ship. So we said to U.S. Lines, "Let's do a joint venture in the North Atlantic, and we'll use your Tilbury Docks in London and you do the marketing, and we'll provide everything else."

CC: And they probably didn't want ...

AG: And they said, "Well, what on earth are we gonna do with them?" And so we said, "Well, we could put whiskey and china and woolens." "Whiskey in containers? Are you crazy?" They threw us out! We were just so stupid! And you had guys like Jones Devlin, okay? Just absolute..you know, and ... sunk a fortune into buying a totally conventional breakbulk ship, with all the stuff in the offing, okay? And they went into twenty-year leases on the North River on finger piers. I mean ...

CC: The whole thing was obsolete.

AD: When they were buying those ships, were they on subsidy program?

AG: Yeah, but they bought twenty conventional breakbulk ships at the time while this is happening. And then they spent a fortune fixing up all these finger piers just to be better finger piers...

CC: It was a shocker, it was really..I mean, it was almost a case of ignoring what was happening all around them.

AG: Because you didn't want it. I mean, this decision ... by a guy named Jones Devlin, who was really kind of an buffon. He was their operating vice-president. And a guy named Andy Warrick, who was their house stevedore. I mean, this was a guy making the decisions for this big company, these two men.

CC: But remember, the company was a passanger ship company. They were the United States and the America. They were the biggest shipping company in the United States, bigger than Lykes. Fifty-two ship freighters at the time. They dictated and they were powerful and they ... And these guys really, in fact, were reactionary and lived in the past. And they had a very comfortable deal, so why should they screw it up by doing maverick things like Malcom, who was ... Make them uncomfortable. Yeah. And why screw up something that was..and mind you, it wasn't that they were alone in this. All of the foreign companies, too, didn't have a clue as to what container..didn't want to know. And their attitude in

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those years..my recollection was, "Look, we've been in the shipping business for a hundred years. We know how to operate ships. Don't tell us about trucks, don't tell us about..that's somebody else's business." And even Jim Henry [a prominent naval architect and president of J.J. Henry, Inc.]..in his later years, even Jim Henry had that attitude.

AG: Yeah.

CC: I said for example a naval architect really can't be a naval architect in this business today unless he understands containers, trucks, refrigeration, cargo handling, piers, terminal operations ... "Nah, nah, nah, nah, nah, nah! Just the ship." You operate from pier to pier, from dock to dock. And a lot of these people who had come ashore from seagoing careers--such as we've had, you know--knew ships, knew how to operate ships--I'm talking foreign as well as U.S.--and sea captains, and so forth, and "We know how to operate ships, so don't tell us about terminals and don't tell us. That's somebody else's job."

AG: And so if you haven't been in command of a ship you wouldn't understand.

CC: So the point was, the real point was, that they didn't have intermodalism as a concept ingrained in them. And they didn't realize that operating the transportation, any of the transportation legs, you know, once you hook a locomotive to a train and head for San Francisco, you know? That's the easy part of it. Once your plane has taken off and the pilot is sitting there with the stewardess on his lap, eating his lunch, you know, and having his drink, you know, that's the easy part of operating an airplane. And once the ship drops the pilot out here, that's the easy part. Complications don't really start occurring until you try to move cargo through Kennedy Airport, or 'til you get in a classification yard with your trains, or 'til you're in a marine terminal somewhere--that's where the ingenuity and the management and the real expenses are, you know? And so forth. So the real guts of transportation is where these modes interface with each other.

AD: Well, we know that now, but it strikes me as not surprising they didn't know it at the time. From what I've read and heard, it sounds like Matson attacked that problem. Not through intermodalism, which I don't think was a term that was current then, was it?

CC: No.

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AD: But through operations research, which was a World War II kind of term.

CC: Yeah, that was the vogue; Ford Motor Company really set up their OR. Yeah, that was the vogue term, I guess, in those days, OR, you know? It was the use of mathematics and science to, you know ...

AD: But you start with a clean sheet of paper, you don't start with your traditions.

CC: Not necessarily. But while we're on the subject of arrogance... You know, any discussion of who the pioneers were in this thing has to obviously include Matson, too, and there were some key people out there. One of the people I would identify, for example, as being so vital and on the same scale almost as Tantlinger, would be Leslie Harlander, who is a ship master, MIT graduate, you know? So he was one of those people that sailed on deck and understood the realities of sea, but also was able to see science and technology and how it all fit together, and also happened to be a forward leaning, thinking person, and was ingenious in a lot of these different methods and technology, in the early standards and so forth. And so in the vintage '58, '59, when they started their containerization efforts and started converting ships and building these big shore cranes and stuff like that, they were breaking ground, too. But they also had a group within Matson which was an OR group, right? Led by Foster Weldon ... but this is an example of how people can get hoisted by their own petards, you know? What Foster Weldon did was he looked..you know, he said, "Okay, those guys back east - Grace - and Malcom and the rest of them--they, you know, they're worried about Pennsylvania and the highway laws there, and Venezuela," and all this other--Puerto Rico, and stuff like that. He said, "We have a unique system on the west coast here. We're out west here, not east. What we have is Hawaii," you know, which is what they were really serving. They were in the sugar trades and the breakbulk trades to Hawaii, and so forth. "We have the West Coast Highways, which are different than the East Coast. We can move double bottoms on our highways." In other words, a semi-trailer with a trailer behind semi-trailer, you know? And so we have different highway laws, we have different road lengths here, axle loads, bridge laws, and we have different cargo densities, and so forth. And so we're gonna do a big OR study here, and we're gonna come up with the optimum size container for the West Coast service, right? So they researched the whole damn thing and they looked at seventeens and twenties and forties and thirty-fives and

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everything else, and they came up with twenty-three feet. They drew a curve and they curved the optimum size on the curve, right? The peak, in terms of whatever criterion they were using--return on investment and whatever--was twenty-three feet, right? So they said, "Twenty-three feet."

AD: I think twenty-four. My memory says twenty-four because it's twenty-four now, and I think they haven't changed.

CC: Twenty-four..did I say twenty-four?

AD: I think so.

CC: Twenty-four, all right.

CC: I'll tell you in a second, as soon as I..because there's so many numbers flying around. There's twenty-seven's now and we're talking forty-five foot containers and forty-eight footers and fifty-two footers now, and there's the European size and the swap-bodies are coming at forty-three and a half foot. So we're getting so many different sizes now that I'm in my ... years here forgetting. But let's say twenty-four feet, okay? But the peak of the curve is twenty-four feet. So they said, "That's what we're going to do." And they built their entire system around twenty-four feet. Well, if you look at the curve--now, it came after the fact--but you look at the curve, all right? And the vertical axis on the curve is the criterion mark, return on investment, right? Right. And the horizontal axis here is length, right? Ten feet, twenty feet, thirty feet, forty feet, whatever. This curve looked like this. This is twenty, thirty, all right? This curve looked like this. Right? And there's the peak twenty-four feet right there. But if you go back to twenty feet or you go up to thirty feet, or take in any other size on their curve, it wouldn't have been a half of a percent different, in terms of response. In terms of confidence .. if it had any concept of confidence limits or error or done a sensitivity study ... The whole thing was fraught with assumptions, anyway.

AD: I'll just say, for the sake of the tape, the curve you drew had return on investment essentially flat between about twenty and thirty-five feet, and saying that they could have picked any figure in there and ...

CC: They could have picked any figure on it and been compatible with things, but they didn't, and they ended up with a maverick system. And that's what I call..that's what I call scientific arrogance. I mean, you know, trying to purport that you're using an optimum and hiding behind OR, which in

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those days was the big, important ...

AG: Let's go back, if I might, just before we leave this to the U.S. Line's arrogance, if we want to call it this. The industry was so absolutely convinced that this was ludicrous--it's okay to go to Texas or Puerto Rico, but who cares? And this Grace, look what happened to them in Venezuela. They so believed this they convinced the longshoremen. Okay, you were saying, "How could you bring in this system without all the turmoil you had in Venezuela?" The reason was they didn't think it was gonna affect them, okay? They absolutely convinced them at negotiations. So we went through a whole contract negotiation with no penalties whatsoever. In fact, to Puerto Rico you could still use short gangs because they had a different deal.

AD: You're paying hourly?

AG: Yes! Okay? And so that stayed in, because we didn't have to fight for it, because there was guys like Jones Devlin sneering at us. And, of course, you know, he was a soulmate of the Gleasons, and all these guys, 'cause this is what they believed, and you couldn't see much evidence of it. I mean, there wasn't any job loss, because there was really relatively so much work. And so it wasn't until the negotiation after this that they begin to wind up. And really the penalties were relatively minor, okay? Then guys like Teddy ... people weighed in with the guaranteed employment thing, which really ...

CC: The longshoremen weren't afraid. I remember, while at MIT we had a student naval architecture society up there that I headed up one year and we tried to create different events throughout the year. So I decided we would have a debate one year on the subject of automation on the waterfront. And so I called down to New York and I asked Hank Teterman to come up, to..well, he was an engineer, a naval architect, you know, and he could talk on the subject. And he was familiar with what Grace Line had been doing in containerization; and I'm talking now 1959 or so. And then I called up the longshoremen and I wanted Captain Bradley to come down; Captain Bradley is the head of the ILA, national. Okay, and Captain Bradley was unavailable. So they said they had a younger guy who was coming behind him, would I mind if they took Teddy Gleason? And I said, "Well, I never heard of Teddy Gleason before. No, I think we..you know, we want Captain Bradley," you know. And I turned down Teddy Gleason ... [laughs] ...

AG: Teddy was a checker in those days. He headed the Checkers

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Local.

CC: Well, he was the heir apparent. So I was really disappointed and they were disappointed that I was turning Gleason down. You know, they were..I guess wanted to come up to MIT and gonna get a trophy ... They said maybe there's somebody up in the Boston Local, but we can have him come over. And I said, "Well, anybody is fine then." And they said, "All right, we're gonna send Red Moran over."

AG: Oh, boy.

CC: So I got Red Moran to debate Hank Teterman in a room that wasn't any bigger than a classroom; we were a small department. We had a lot of navy students up there, but the civilians couldn't have been more than a dozen people, you know? Well, when the announcement went out that it was Red Moran..and I wasn't aware of it at the time, but he was an extremely colorful figure on the waterfront; ran the Boston waterfront.

AG: Like a fiefdom.

CC: Oh, yeah! Tough son-of-a-bitch. Boston Irish tough son-of-a-bitch. And when the word went out, suddenly the people who wanted to come..we kept moving to larger and larger auditoriums, and we couldn't handle the crowds! They came from the Harvard Business School ... from the Sloan School, the press was there. And the next thing we knew we had a huge, huge forum for these two guys--Hank talking on the subject of automation, meaning containerization in those days.

AG: This was mechanization. But they adopted automation, which really didn't apply at all.

AD: Yeah, you've complained about that usage. I see why now.

CC: And then we had Red Moran, who charmed the socks off of the audience in my recollection. He was talking about pilferage. I mean, he just..he stood there in front of everybody justifying pilferage, you know, I mean ... [Laughs] ... "on the water," you know, "in the rain and the fog and the cold and the snow," you know. And they're out there catching pneumonia and you know. So what's a bag of coffee or so, or something, you know..a pair..a couple pairs of shoes. And so forth. He wasn't terribly concerned ...

AG: Red permitted the use of forklift trucks maybe..what year was this?

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CC: This is '59.

AG: Well, they hadn't been using forklift trucks in Boston for ten years at this point. They were hand trucking ten years before ...

CC: Hurdy-gurdies, they wouldn't allow them.

AD: What is a hurdy-gurdie?

CC: Well, I had occasion because we were experts in a recent case up at Massport, where a longshoreman was killed in a container terminal where a truck had come around a corner and hit, dragged the end of a container and squashed the checker, actually, standing ... this was really a sad story. And in the course of the work that we had done on that particular case, they kept talking about the hurdy-gurdies, you know? The hurdy-gurdies in the yard. And I said, "You know, I've been on the waterfront a lot and I've never heard..I think I know what a hurdy-gurdie is." But, you know, here's a term being used in Boston, and so I went back and researched it. In Boston what the hurdy-gurdie is, it's a top-lifting forklift truck. It's a forklift truck that had a spreader suspended from above and perhaps a container from below that moves it around. So they've nick-named these hurdy-gurdies. But what a hurdy-gurdie is, was a hand truck used in--not medieval time--but maybe the seventeenth, eighteenth century in England, that usually had a hand crank on it and had a hand organ.

AG: Yeah, yeah! And a monkey!

CC: And a monkey ... [laughs] ... And you'd come..the guy would come around with a hurdy-gurdie. So any kind of a hand truck up in Boston was a hurdy-gurdie. And you could move things around with a hurdy-gurdie. So when the containerization came and they got to nick-naming these things hurdy-gurdies.

AD: The powered fork lift was from the twenties, wasn't it?

AG: Well, in industry it was, and it was well established in New York waterfront. But in Boston they were absolute power, okay? And they always, up 'til today, probably there are five hundred longshoremen in Boston that own jobs. And then they'll bring in extras as they need them, so that they figured no matter what happens there's enough work for these guys. And they have guaranteed wages, too. But they would not allow..in other words, they were doing everything, you know, with mule labor. They had kind of big, flatbeds with

a swivel wheel on front so you could direct it. But they would haul. And I think they had tractors that would pull them, okay? And then just kind of man-handle all the stuff with the heavy lifts if you couldn't handle it with a hand truck.

CC: But those people had worked the North Atlantic ... And I was more familiar with the European, the U.S. Line Service, having sailed with them, and so forth. Those ships would come over and they would distribute their cargo all the way down the East Coast, starting with Boston, and then the Port of New York over in Brooklyn, and then the North River piers, and so forth; then you'd go to Philadelphia, Baltimore, Newport News, Norfolk, and so forth. The reputation in Boston..I mean, the reputation got worse and the expenses got worse the further north you got. And Boston the epitome, that was it for pilferage, for breakage.

AG: They used to ship shoes out of Boston with the lefts in one box and the rights in another box, okay? We'll try and confuse them ... They had to match up the two boxes to make them any good ... [laughs] ...

CC: I used that as an example in a cargo course in a transportation course up at MIT. A guy who was a professor up there later became the head of the Federal Railway Administration. His name was Lem Sheckter, I think, he was a professor up there and he was still running a transportation seminar. We said that there are ways to convert..and I think my thesis in that particular seminar was that you can convert cargo to make it more transportable. And he said, "Give some examples." And we talked about slurries, for example, for moving bulk, dry bulks, turning them into slurries, and that's one way of converting. And I said another way is you can decrease the value of the cargo to make it more transportable. He said, "Well, for example?" And I said, "By shipping all left shoes in one lot, and shipping all right shoes ..." They had a problem with that. They said, "How does that work," you know? Well, the fact is that you destroy the value of the shoe.

AD: And, you know, that's what you see in any sidewalk display, one shoe... Let's go back to the theme of arrogance once more, to the difference in cultures between the trucking culture and the maritime culture at the time that containerization was coming in. I think that's a theme we might squeeze a bit. And I'm wondering, to what extent this sort of self-satisfied, enclosed, maritime shipping culture, particularly in the international trade, was supported by all the federal programs that existed.

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CC: Part of it, you have to remember, was the mind set of the labor leaders in New York. Their model was the European trade unions, very tough, very militant.

AD: But they had a lot more political power in Europe.

AG: Yes, but these guys were very close to your ward leaders here. I mean, [he] was providing employment. They weren't labor leaders such as in the classical sense, they were politicians.

AD: And they were metropolitan.

AG: Yes. And again, they would fractionalize jobs. You know, again, like the European trade unions, or the shipyards, or what have you, this guy carries the light bulb, this guy carries the ladder--you know, the Javits's Center in spades.

AD: That's the labor side.

CC: Yeah, but your management side ... But your question..you know, I've grown up now through this Kings Point kind of culture, with the Merchant Marine Act of 1936 practically being like the Magna Carta. And, of course, it didn't revitalize our Merchant Marine. It was far thinking at the time, I think it was..you know, it's a wonderful program and certainly given the warmth of those early war years, or the coming war and so forth, it was the right thing, and so forth. But in my opinion what got set up down in Washington was a bureaucracy which worked during the war..I mean, we were able to build fleets of..incredible! I mean, as a matter of fact, I think it's unique in history. A shipbuilding program of early, prior to, and then during World War II. And what happened was we had this huge bureaucracy down there called at that time the Maritime Commission.

AD: The War Shipping ...

CC: Well, War Shipping Administration and the Maritime Commission, which later became the Maritime Administration. And this thing was set up in place so that when the end of the war came we had trouble, as I think we always do, in downsizing ...

AD: Demobilizing.

CC: Yeah, downsizing government, you know? And so you had this big structure here that was set up to promote the U.S. Merchant Marine. And there were a lot of ships around, so

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we were able to transfer a lot of the surplus ships not only to our fleet, but we very kindly gave them to the Greeks and set them up ...

AG: We set up every Latin American country in the shipping business.

CC: And so we set up all of our competitors. But we set up the U.S. Merchant Marine basically and established a pattern for them. And that pattern..and again, Andy is better equipped to discuss this than I am, but it involved regulating the trade routes, doling out subsidies, construction and operating subsidies, and paying it out, you know..almost as though the shipping lines had to come as supplicants to the sultan, you know, on bended knee, and prove and request and do this and that, and the other thing, and then they would be allowed to maybe add one more sailing or alter one more, pick up one additional ... or so forth. But the bureaucrats in Washington held very, very tight reins on everything to do with the U.S. Merchant Marine; that is, the dry cargo sector of the Merchant Marine.

AD: The subsidized Merchant Marine.

CC: The subsidized Merchant Marine. And that included, you know, the frequency of which the ships would sail, what trade routes they were on, how much money they would get, how many rooms would be, or cabins would be on the ship for the ... the unions ... are they satisfied, and so forth. And when it came to renewing the fleets and getting new ships, and so forth, they would sit on the plans. I mean, the shipping companies would have to come to them and kiss their ass about, you know, how the ship should be this way or that-a-way or the other way, and they would sit back and decide, you know, whether it would so or not so, or how many ships would be in this program, and things like that. So they got themselves very deeply involved in the management of the shipping lines, the deployment of the ships, the design, the replacement of the ships, and so forth. So they were very much a part of what was happening in terms of replacement ships, and design of ships. And I think that one of the terrible things that happened to our Merchant Marine in the periods fifties and sixties is that the lessons that we could have learned out of World War II, using all those World War--the C2's and the C3's and the C4's, these mass-production, standardized ships which were so useful to us--were phased out by a big program pushed through ... I can't think why I'm having trouble remembering ...

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AD: The Mariner Program?

AD: Yeah, the Mariner ...

CC: That was Ned Cochran, Admiral Cochran. Admiral Cochran was a shipbuilder, Navy shipbuilder, you know, deeply involved, and so forth, you know, had this concept of the Mariner, right? Which was a good one, I thought, at the time, you know? And it was designed to be a modern replacement for all these World War II ...

AG: It was fast, 25 knots.

CC: And he pushed for that, and he was another Robert Moses kind of guy, that kind of forceful and so forth. And it was like over his dead body that they were gonna get that through, but he got it through. Somehow he built, what was it, fifty-some, fifty-seven ...

AG: No. I don't think it was quite thirty. I don't think so, Charlie.

CC: That would be another nickel. Okay. But that whole Mariner program, nobody wanted those Mariner ships. He pushed it through and he got those ships..but it was a standard series of ships, all right? And they were fast and they were modern. They had a lot of nice features and mechanical covers and good ventilation, and, you know, reasonable speed and good cargo handling and ... and for the time--which was late forties, early fifties, which was the vintage of the design and the construction--they were great. And when they first started to appear, nobody would touch them, you know? Because they didn't have their hands in them.

AG: I think the first went to the Navy.

CC: And nobody wanted them. Well suddenly, I think U.S. Lines got a few ...

AG: They took eight and that opened the floodgates.

CC: And the next thing that happened is the U.S. Lines ran the Japanese off the Pacific Ocean. I mean, they were delivering cargo. Suddenly everybody realized that, hey, here was an APL and American mail and Pacific Far East, and all these ... They couldn't get enough of them then. And so everybody embraced the Mariner Programs. So you would have said, "Well, gee, here was the C2's and the Liberties and all ..." they were a success. Here's this whole Mariner Program, they're a success. Now we're starting to look at

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the American Merchant Marine, twenty years after World War II, which is like 1945, 1960, you know, '40, '45. So now we're coming to 1960, '61, '62, '63, all of the twenty-year life of these things supposedly is running out. Now it's time to replace all these ships, so U.S. Lines has to replace their fleets, Grace Line, and a lot of the other companies, Lykes Line, and so forth. So they all sit down, and instead of saying, "Let's see what standard series we can build, you know, and let's see if we can embody some modern concept in it," suddenly the replacement of all of these fleets became ego trips for these companies, you know? And they became enamored of, my god, I mean, American Export Lines was more concerned about the shape of the stern of their ship and the shape of the stem of the bow than any other feature to the ship. It had to have that clipper ship stern, it had to have that stem bow. And so, forget the ship was an obsolete, breakbulk ship. And so what you had is all these companies--and we had a lot of companies in 1956, '57, '58, '59 ...

AD: But they're all on CDS? They're all going down to Washington.

CC: It is not doing a job ...And they're playing, playing potentate with all of these companies coming to them, and ...

AG: But remember, Washington had no requirement to make money with these suckers. This was their steamship. They say, "We will give you the money to keep the shipyards in business, but it's up to you to decide whether you can make money with them, okay?" And then, so they kept ... bloody things, and the shipbuilders were all happy.

CC: And the naval architects, which there were a lot around, they designed anything you wanted.

AD: And the greater the diversity the better ... more naval architects and more work.

CC: And so you had in the period say 1957 to 1967, such a diverse, polyglot batch of ships developed, and you'd find one company, even a company like Lykes Lines, which had huge fleets, you know, they'd order three ships, then they'd change the design and then there were four more of a completely different ... Then they'd order three more, and four more, and so forth. And they were all reactionary, they were all breakbulk ships. And then they said, "Well, gee, maybe containerization really is something we ought to at least make some admission to, or ..." you know, so they

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would provide some way to breakbulk some containers onto the decks of these ships, and things like that. And they had [?], you know, which is an awful way to handle containers, but big enough to handle some containers on the covers, and things like that. But it was a disaster! It was a disaster from a design, from a shipbuilding point, from a ship management point of view..that whole replacement program that came twenty years after World War II.

AD: So the government was making money available, but ...

AG: But they had seen the two constituences and that's always been the problem, because half the constituents [were] shipbuilders, shipbuilders yowling for business, and they didn't really have a design or efficiency ... mandate [?]. One of the last things I did was for States Line, who was gonna build five Ro-Ros. Now, we're talking about 1972, the spring of '72, where the container is now well established in the Pacific. And Dant was the president, and I said, "This is crazy!" I said, "You know, you should really be building container ships." But they had done a deal with Bath, Maine and Bath needed the work. The loss of the destroyer program, they were pleading for work, and I know exactly how they made the decision. I said, "What the hell!" I mean ... But if Dant is stupid enough to build these things, then that's his business. But I had another constituent called Bath Iron Works, and so they built five Ro-Ros and States Line went bankrupt, okay?

AD: Were your Grace Line container ships, your first two ships, built with subsidy?

AG: Oh, sure! He didn't build any ...

AD: Washington's indifferent, you're saying, in this ...

CC: The Grace Line effort in containerization was totally uncharacteristic of everything else that was happening in the subsidized Merchant Marine. I don't think that Washington played a part in, let's call it the technology development of our Merchant Marine.

AG: So, but Grace had become an industrial company ...

CC: They impeded things ... and they threw money at programs that didn't make any sense down there. But keep in mind that at this time there were really two segments of the dry cargo part of our business here. One was the subsidized, the overseas, international trading group, right? And then we had a rather sizable domestic group--we had Kalmar [?]

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Lines, for example, which was a division of U.S. Steel running east and intercoastal. You had..up in Alaska you had Alaska, oh darn, Alaska Freight ... No.

AG: Alaska Steam.

CC: Alaska Steam Ship Lines, right? They were running traditional lines up there. You had Bull lines running to Cuba and to Puerto Rico from the East Coast here. You had a lot of companies--Coastal Steamship ...

AG: And you were talking about Matson ... Matson built container ships..they converted ships for Japan, and it was a disaster! They scampered right back to the trade, and then they had two ships building.

CC: Yeah, built in Germany.

AD: But the Jones Act Trade did give the innovators a playing field they could work on, yeah. A hothouse ...

CC: There were others. Let us throw one additional company out here that we haven't talked about, that was around, too. And that's a company called Seatrain. Now Seatrain had its origins back around 1928. They had the idea that they could carry rail cars coastwise between Texas and Weehawken, New Jersey, for example. And there what they had was the purpose-built ships where the rail car would come onto a platform, and they had a huge shoreside gantry crane that would pick up the platform with the rail car with a big box car on it, and then it would come over onto the ship into a well. And then you'd roll the rail car into position on the ship, and then you'd go back and get another one, and you'd load up the ship with these rail cars. And so during the..1928 was the first one and then there were a series of them ...

AG: They also went to Cuba, didn't they?

CC: And Florida.

AG: I think they started to Cuba, and then maybe it didn't work, or something. And that's when they went to ...

CC: Havana, yeah. They were freighting out of Havana as well...

AG: I think they went out of Tampa too.

CC: Whatever, but the point at any rate was that Seatrain was around..and it's kind of an intermodal concept. It wasn't

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containerization, but it certainly was intermodal in the sense that it was moving rail cars back and forth. And as a matter of fact, those ships became very valuable during World War II because my recollection is that Montgomery's army in North Africa, the British Army in North Africa was almost totally destroyed by ...

AG: It wasn't Montgomery's army. He was a beneficiary.

CC: But the point was that all of his equipment was totally destroyed by Rommel as he retreated towards Egypt ...

AG: This was General Alexander and towards Cairo.

CC: And what happened is they determined, Detroit, as I understand it, Detroit converted over into production of tanks and personnel carriers and heavy equipment, armored equipment, for northern Africa, on a crash basis to create enough equipment for him. And the problem was to deliver it. They determined that if they distributed this armored equipment amongst enough ships in the convoy and then sailed the convoy through the South Atlantic and around the cape and up the east coast of Africa, that statistically the submarines would get a fairly high percentage of that equipment and there wouldn't be enough left to do the job to defend Egypt the way they had to. So they said, "Shall we go for broke," you know, and put it all on two ships, "or should we put it in a convoy status..if we put out two ships maybe the two ships will get through." And one was ...

AG: Seatrain, Texas.

CC: Seatrain, Texas and the Seatrain Savannah, I think were the two.

AG: There were four hundred Sherman tanks in the Seatrain Texas, and the Germans knew. They were sitting right off Sandy Hook waiting for these two ships. And all of the stuff came to Brooklyn and they were loaded on the ships in Brooklyn, and they sat and waited for fog and the worst possible days, you know? And when they had the worst weather and everything else, the two ships broke out and they zagged when they should have zigged, and they zigged and zagged all the way around. And, of course, the rest is history. They made it...Texas made it. There were four hundred of the Sherman tanks that could ... Rommel. General Alexander was in retreat, his tanks were no match for Rommel at all. And Churchill, you know, very impatient sort of guy, "Why don't you fight?" He said, "I don't have anything to fight with!" So he fired Alexander like when he's in Egypt. And he makes

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... [Montgomery?] the general. Well, that coincided with four hundred of these Sherman tanks coming. Also, Rommel has extended right across Africa. Then the British are rebuilding their supply lines. They've now got more air power. And the suggestion is that any British general could have won El Alemain.

CC: There was one other ingredient that we only learned about, of course, after the fact, and that was the enigma machine. Yeah, and of course, Montgomery was sitting there knowing exactly what Rommel was gonna do.

AG: Exactly. So although he gets ... [credit], you know, and of course he had the ego to match, to claim all this sort of stuff, but he had advantages over poor Alexander, who was taking all this whopping.

CC: So here I am sitting at Sealand, you know, telling ... Oh, I'm really; I'm losing it. Who was the executive vice-president behind Malcolm, the reporter. Yeah, Mike McAvoy; Mike McAvoy, a reporter for the Mobile Press Register who then headed up the sales department, who then became executive vice-president, chairman of Sealand and ...

AG: Great singing voice ... [laughs] ...

CC: Singing voice and everything else, great drinker, and everything else. But Mike was a reporter. I mean, he was a reporter and a flair for news, and we're sitting having lunch, and this is like around '63 or '64, sitting over there ... And I'm telling ...

AG: Are you still a mechanical engineer at this time?

CC: No, no, after a year they moved me as chief naval architect.

AD: Okay, you're gonna have to try your singing voice. I'm about to run out of tape so, hold that story.

END TAPE 1, SIDE B. BEGIN TAPE 2, SIDE A

CC: We were talking about North Africa and Seatrain, and I'm sitting there having lunch with MacAvoy and a few others, and I said, "Well, you know," first of all he wants to know where the role [?] that the Seatrain Texas, and I think it was a Savannah. I thought it was two ships. I said, "You know, Seatrain," and at that time Seatrain was an arch rival of Sealand. They were both in the Puerto Rican service, they were both in the coastal service. And Seatrain at that time was just getting into the container business. And they

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were giving Sealand fits. So if Seatrain had anything, Sealand didn't like it, you know? And I said, "But you know, we have a famous ship in our fleet here at Sealand." And McAvoy said, "Well, what's that?" you know, very skeptically. And I said, "We have the first ship to return fire, the first American ship to return fire to the Japanese at Pearl Harbor." And he said, "Oh, bullshit!" you know, "Ah, ah, ah, ah," you know. "I'll betcha we don't have that ..." and so forth. And I said, "Yes, we do. We have the S.S. Detroit," which was a C3 that we acquired from the reserve fleet that had been a seaplane tender, and I'll think of the name of it in a second ... But, we took the ship and converted it into a car carrier. The Puerto Ricans were buying second-hand cars like, by the jillions. And so we converted it at Todd Hoboken, that doesn't exist anymore. But that shipyard's in Hoboken, and then put it into that service out of Port Newark. But this ship was one of the Seatrain...sorry, C3's built in '39, and was seaplane tender sitting on the end of battleship row. And there was a Navy chief up on the, out on the bridge wing. And that morning, right at eight o'clock in the morning when these guys came flying over, and he was able to get the cover off the machine gun, and on the first pass, you know, started firing away at them.

AG: How about that!

CC: The name of the ship was the U.S.S. Tangiers. It was the U.S.S. Tangiers. And so, MacAvoy..I had to show MacAvoy the pictures, the aerial pictures of Pearl Harbor. And I think it was in the book Day of Infamy, or something like that. So we had a famous ship ... too. But Seatrain..the reason I mention all of that is that Seatrain, while they had started this car, this rail car, box car transportation business starting in '28 and then to the thirties, and during the war their ships were used..after the war they built some ships and they converted some ships, stayed in that box car business until containerization came along and saw the advantages, and then jumped into the container business around 1960, '61, '62, and made a pretty valiant effort to create a container ship fleet. They let the rail car transportation business kind of die ...

AD: Could they use the same ships?

CC: They did, yeah. In fact, a number of their ships were converted train carriers.

AD: But essentially the same system? In other words, they went down through a central hatch and then the containers were

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pushed to each end the way the rail cars ... I don't know if they double stacked them.

CC: But then they started, they did that, too, because that was the easiest way to convert those ships, and then they in fact converted some ships. They used to fight for some of those ships out of the reserve fleet the way Malcom was. And then you had a traditional carrier in the coast-wise and east coast trade, Bull lines, that had been around forever. Another company that said containerization was not..you know, couldn't do anything, and so forth. And practically got run off the sea before they realized they had to do something. And they ran down to Washington and got two ships out of the reserve fleet, two ...

AG: C4's

CC: Two C4's, C4SA2's ... They were kind of like a forward house and a well deck amidships, and then the engine aft and the superstructure aft, too; split house kind of arrangement. And they started desperately trying to convert those ships at Todd Erie Basin in order to catch up, and then put some modern tonnage in their Puerto Rican trade before they got run off the road by Sealand and Seatrain. And they didn't make it. They just couldn't get, they couldn't get the ships in ...

AG: They couldn't really..it was a compromise ship. It was half breakbulk and half containers, so you could move the containers off in relatively few ... [hours], then you sit there while they ... [offload breakbulk] cargo.

CC: But the point is they never even got to that point, because they were half-way through the conversions when they went bankrupt. And by that time I think the company had been acquired by Goulandris and the whole thing was a disaster, financial disaster. And Sealand acquired those two ships. And so I had the task of turning those things into something that Sealand could use. But at that point they were committed to a combination breakbulk and container system, and we then converted the holds over to full containers. We ended up with a crane on each ship, a shipboard gantry crane. And we re-named the ships the Seattle and the Anchorage. And when the Seattle sailed out of New York, or was ready to go on loading, we went through that whole program. It just coincided with the big earthquake in Anchorage, and we were about to inaugurate that Anchorage service up there. So we loaded the ship out here on the East Coast with all the kind of stuff that they were gonna need up in Anchorage because of the tremendous earthquake

that they had had up there. Another interesting aspect of that is that when Malcom decided to go into that Alaska service, he was told by everybody that they would have to serve Seward, Alaska in the wintertime, because you couldn't get in and out of Cook inlet in the winter. That Cook inlet is fed by three glaciers, they have thirty-foot tides, tremendous currents. The Coast Guard takes all the navigation equipment out of there, and everything else. And Malcom was ... [felt very] ... uncomfortable with that, because his philosophy has always been, "You take the cargo to the market place," as close to the market place as you can. And Anchorage was the population center up there, and everything else. And the people were trading up there; Alaska Steamship, using old World War II Liberty ships, would plow up there in the summer time and then unload at the city pier. But in the winter time just couldn't fight the ice..underpowered, and they would then go to Seward and the Department of Interior ran that Toonerville Trolley a hundred or so miles up to bring all the milk, which by that time got sour, and everything else, up to Anchorage. So Malcom sent me up there to see what I could learn about the trade up there. And I talked to everybody up there, and they all said, "You can't do it." But they could never, nobody could ever prove why you couldn't do it. So my report to Malcom was we can do it, and Malcom decided to do it, and everybody told him he was crazy. And then the shiprunner maiden voyage up into the ice was told by the Coast Guard not to go in there. The Coast Guard says if you get in trouble we're not helping you, and so forth. And the captain was Okay Collar, not Leo Collar; his brother, right. Collar, who ran Crowley's operation for many years. Keith Collar was a captain on the ship. And he told the Coast Guard to stick it in their hat, and went up in there. And the second ship came a week later and they alternated on alternate weeks, a weekly service, from 1960--and I guess that's 1963, '64--until today. They've never missed a sail in and out of Alaska.

AG: Of course, they finished the Alaska Steam.

CC: And that was the end of Alaska Steam, and Alaska Steam was trying to pile boxes on top of the decks of their liberty ships, and they just gave up. They couldn't compete with a fully developed container system, integrated container system. In other words, you couldn't have a breakbulk operation that could do the... So there was Bull Lines in the traditional trade here; there was Alaska Steam up in..at that particular trade, you know, falling by the wayside in the face of containerization. And while this is going on, of course, you've got American Mail and U.S. Lines, and all

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this other people, you know, just saying, "Containerization, nah, it's a fad," or, "It's a passing fancy," things like that.

AG: I was going to go out and see Bobby Pfeiffer who is still kicking around.

CC: Yeah, you'll get from Pfeiffer the management side. But from Les Hollander you'll get the kind of details that I'm talking about here, the twist locks and all those other..little features. So my days at Sealand, which started in, say, beginning of '61 ...Through '68. It was a period of seven years, or so, over at Sealand..were really years of converting ships--42 ships--and, of course, a lot of the equipment that went on them, and so forth. But we took everything that the government would give us out of the reserve fleet, anything that would float. If it was a T2 or a T3 or a C4 or ...

AG: I remember seeing a T2 that you were converting over ...It was in Hoboken.

CC: We did four ships, one at Todd Hoboken and three at Beth Hoboken. And the first in the series was the Elizabeth Port, and that was the one down at Todd, and the other three were the San Juan, the Long Beach, and the San Francisco.

AG: Whatever it was, the thing that I remember distinctly, because I thought this was crazy, they had really essentially taken this stern and put a whole midbody. And, of course, the stern was much narrower than the midbody. So you just had kind of a gusset plate ... I'd never seen anything like that. And I said, "These guys are nuts! You can't run a ship like that!"

CC: Well, the reason, the rationale behind that is we had designed the midbodies and the midbodies were built in Germany at a place called Schleeckerwerk. Willie Schleecker was one of Hitler's wunderkinder, his boy wonder, industrial genius, and so forth. Worked for Speer, I guess. And after the war managed to acquire some interest in coal transportation, and then finally a shipyard in Hamburg called Schleeckerwerk. And he had the contract to build these four midbodies, which had been designed--in fact, J.J. Henry was doing the design for Sealand at the time, or Pan Atlantic at the time--had designed it to integrate into T2 tankers. The T2 tanker, as you remember, was a turbo electric 6,600 horsepower propelled ship. Just before we took delivery of those midbodies in Germany, we were able to find some T3 tankers which were not turbo electric ships,

but direct drive, steam turbine, driven ships. So we had four T3's available to us. And those T3's are a different dimension than the T2's, and therefore we had to shape the midbodies to fit the T3 shape, rather than the T2 shape ... So that's what you were looking at. The C2's that we had had earlier, the Waterman C2's, the Gateway City class, in fact we fitted with sponsons, very large appendages along the sides to give the ship not only added breadth, which we could put rolling gantry cranes and more deck containers on, but also to give it more stability.

AG: More strength! Because we were ripping all their innards out of them. We did the same thing with the Eleana and Leonore.

CC: If you look at the Eleana and Leonore and you look at the Gateway City class, you see very, very great similarities between those two ships, because of the ...

AG: Because these are essentially huge girders along the side [that] tie them together.

CC: But stability was a big problem, because in..you know, if you look at a container ship, a container ship today, and look at the models around the office here, you see half the cargo sitting on deck. And the ships were never designed to carry..they were very narrow ships. The C2 was a ...

AD: Were these sponsons put near the water line, or ...

CC: Well, they started at the main deck level. You go outboard probably six or eight feet, six, seven feet outboard on either side, and then slab sided going straight down until you get near the water line, then they would taper in. In otherwords, like a 45 degree angle or so.

AD: So you're getting the stability when you roll.

CC: When you roll then the sponson would dip under, but when you're not, when you're upright, it's not in the water, or it's very close to the water. If you deeply immerse the ship--which means you've got a lot of cargo on deck--you've got wider stability. But if you're running light you're out. So the sponson didn't really impede or add much to the resistance, the weight-making resistance of the ship. Unless the ship was really deeply immersed and you needed it for stability purposes. But Andy is right, one of the unique things about container ships is that we got rid of all the decks on the ships. The ship essentially became a bathtub.

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AG: Yeah!

CC: And traditionally the structural design of a ship, and the structure of a ship, was monocoque construction, or a tube, like a tube, that depended upon the main deck and the bottom as the upper and lower flange of a girder and bending. And, you know, you had some hatch openings in the ships, in traditional cargo ships. But when we started creating these cells, the vertical cells in the ships, we cut away the decks of the ship. So you needed to put that back, and these sponsons were a great way of adding strength to the ship. So we converted everything that would float..every time Malcom saw a ship he started to imagine how many containers we could put on that. So we ended up converting a lot of T2 and ships out of the reserve fleet. And in those days the program was that you had to, you had to turn a ship in..you could trade ships, you know? Turn one in to get one out. And so you always needed what became known as box-tops, you know? In the old Wheaties ... You'd mail in the box tops ... And the Maritime Administration was willing to accept literally anything in trade. I mean, they would take a ferry boat, for example. And we in fact ... we bought two ferry boats and traded them in.

AG: But this was only available to the non-subsidized companies. The subsidized companies couldn't do this. They had to find..they had to build new ships.

CC: So it had a way of stimulating ship building, because these conversion programs were ...

AD: That's interesting ... a real subsidy for unsubsidizable companies, isn't it?

CC: But people said, you know, "Well, you saved a lot of money by doing this." And I've often reflected back and said, "What was the real advantage to Malcom and Seatrain, and some of these others--Matson--was it the money they saved in the conversion?" 'cause they spent millions and millions and millions of dollars on these conversions. And I say to myself, "No, the real advantage was that we were able to convert these ships in anywhere from 90 days to 180 days. I mean, some of the conversion programs we went through--and I'm talking about cutting ships in half and jumboizing them ...

AD: Did you re-power them, or did you always use the ...

CC: No, we never ... In those days we weren't into re-powering. Everybody was steam oriented. And it was really..I mean,

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the tremendous advantages that were accruing were through cargo handling--not saving fuel or automation or labor, anything like that. Remember, the ships, the productivity of the ships, the ships that would sail on the North Atlantic, for example ... for U.S. on the C2, that ship had a crew of 52 people on it when I was a cadet; had two pursers or three pursers on the ship, and, you know, senior engineers as well as junior licensed engineers, and four mates and a bosun and a carpenter and, you know, two day-maintenance men, and cooks and bakers and pantry men, and all kinds ...

AD: And no one was looking for efficiencies there.

CC: And the point was that the ship would go to Europe and we would spend, for example, in one trade--the Liverpool, Manchester, Dublin, and Glasgow run--we spent nearly a month over there. We spent a week up in Manchester. We'd take the stack off the ship and go through Manchester Ship Canal; spend four or five days in Liverpool, long enough to fall absolutely, madly in love, you know? Go across to Dublin, spend a week, a week and a half loading whiskey.

AD: You'd do this breakbulk, or container?

CC: Breakbulk. We're talking the fifties and the C2's. And then we would come over and we'd come straight to New York, and then we'd go up to Boston and we'd come back to New York. We'd go over to Erie Basin, or maybe Brooklyn Army Base in Brooklyn, and then we'd come back to Thirty-fourth Street and then you'd shift up to Pier 61 or 62. Then you'd go down to Philadelphia and then you'd go down to ... And then you'd down to Baltimore and we used to spend the weekend in Baltimore. Then you'd go down to Norfolk and you'd go to the Navy Base in Norfolk. Then you'd go over to Newport News, right? And then you'd come back up to New York. Then you'd load out, and you'd be ready to go to Europe, you know? And so, you'd spend a month on the coast of the U.S. and a month in Europe and a month here, and you'd spend two times more time in port than you'd spend sailing around, right? "Here comes Malcom," you know. And you'd come in and out in twelve hours, sixteen hours..fourteen, fifteen, hours you're in and out of ports, completely loaded and discharged. So, if he had a buck to spend he was gonna spend it on containerization, not on trying to squeeze a few extra barrels out of the fuel bill, you know, or trying to automate the ship.

AD: Did that change in the rhythm of the voyage lead to any union difficulties with the shipboard personnel? Quite a

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change in life, spending hours rather than days in port.
Did they just accept it and ...

CC: Nobody ever asked me.

AD: Okay. And then they don't talk about it.

CC: I mean, there were enough people sailing on tankers and bulk carriers that never got ashore anyway.

AG: Guys on tankers live like that for years.

CC: And the container runs were a steady run. So they were like homes to..I mean, you know, the people would..live very regular lives. And they didn't mind that. I mean, people that went to sea on liner type ships, they'd go all over the world. You'd never know when you were gonna be home ... You know, you had schedules but it was a kind of a vagabond's life. Whereas the people on the container runs, you know, you were back and forth. They always sailed from New York on a certain day, so they were..people preferred that kind of lifestyle.

AG: Well, service to Australia and New Zealand, that was a 12 month trip. Then they also went out to India and God knows when they came back, you know?

CC: I made an Isthmian trip three months to the Middle East. It wasn't sail and be back. I just hoped that I would be back in time for the school semester to start.

AD: But it is liner traffic. You were on schedule, but kind of on schedule.

CC: Kind of on schedule, yeah. Even Farrell Lines ... carried a lot of passengers, you know, to South Africa. But once we'd go off the east coast of Africa, Lorenzo Marques, Durban, places like that, I mean, you waited for your place at the ore berths, and they were bringing copper and ore out... The port congestion was such that you'd lie in anchor and, you know, weren't terribly sure when you were gonna get in and out of the ...

AD: Now would you carry ore breakbulk?

CC: Yeah!

AG: This would probably be semi-refined ore. It was on a cargo ship.

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CC: But we'd dump it right in the square hatch. As a matter of fact we used to spend too much time trimming. I mean, you'd load then sometimes you'd have to go out on anchor, and native laborers would go aboard and manually trim the ship, trim the ore out and then come back. But you'd lose your place at the loading berth. So this guy -- I remember his name Cordineer ... He was a Chief Mate, and he said, "There's gotta be a better way". He said, "Why don't we take one of these steel hatch covers we've got and we'll put it right down on the square of the hatch." You know, after they'd build a little pile. And then as the ore comes down we can shoot it right into the wings. It hits that and it'll go right into the wings. And they kept moving it around. And it was a great thing. I mean, it was like automatic trimming. Boom, it hit ... And then we took the hatch cover off and put it on the hatch. That hatch cover was like this! You know? And we needed an ABS special ... [laughs] ... to get us to a port where we could build a hatch cover for the ship... The San Isabel I was on? You asked me who the captain was. I'll tell you who the chief mate was. It was Andraesen ... Mickey Rooney! ... [laughs] ...

Mickey Rooney and Terromoto, Altara moto. At that time he was the chief..and he was a nasty bastard, especially to cadets. Especially to me! He was to me. He told me one time, he says great, cadet... 'cause he'd come up through the hawse pipe, and therefore he was resentful of these guys that we're calling cadets and people who went to school and stuff..school boys. He said, "I have a sea project for you. You're working with a cadet, you're working with the bosun today." "Fine," I had no problem with that. In fact, I used to enjoy it. "You're gonna chip paint today, okay?" "Fine, yes sir!" He said, "But I want to run an experiment." He said, "I want to see whether a person using two chipping hammers can chip twice as fast as somebody with one chipping hammer." And I said, "You can't be serious." He said, "I told you, I want you ..." Well, I got ... Well, of course, the crew thought this was a funny thing ... And I'm embarrassed. But, you know, you do what you're told. You know, you do it! And so I'm out there, you know, hammering away with two chipping hammers ... Yeah! But I don't know, making the most of it. But, you know, you're not there to chip paint, you're there to chip rust, and you've got to watch what you're doing. You can't watch two chipping hammers. So it comes coffee time, he comes out to see how I'm doing, working, 'cause I can't see, you know? I took it serious, but, you know, I said, "I just don't think you can ..." "Well, you just keep doing this," you know? I said, "But ..." And he said, "I told you, you keep doing

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this! You're gonna do this all day long." So right after lunch, you know, suddenly one of the chipping hammers slipped right out of my hand. And he came back and he says, "Where's ..." I said, "You know, I was trying to watch both of them, but one just kind of slipped right out of my hand!" ... [laughs], he was really tough on ... I mean, unfairly. And I kind of forgot him until with the Delta Line thing his name came up one day, remember that?

AG: Well, he turned out to be a fairly decent captain.

CC: I never forgave him.

AG: Well, I don't blame you! Were the Matson ships the first new ships that you actually had, or had you had any new ships before that?

CC: Me, meaning what?

AG: Sealand.

CC: Oh, Sealand! Um, no, because those forty-two ships included a lot of ships out of the reserve fleet--C4's, a lot of them.

AG: No, but a new building.

CC: Yeah, okay. And then we built midbodies for the one that we talked about. And then along came Litton Industries and they financed a lot of Malcom's projects, because they owned the shipyard, and they built..and so Malcom talked them into converting half of the Waterman Fleet to the weight cost [?] and these Waterman C3's. And at the same time we had some more C4's that we built fore bodies for. Not just midbody, but a new bow and a fore body, you know? But we still kept saving some old junky part of the stern, and stuff like that. But we've never--up to 1968 and we even built the New Yorker and the Floridian; those ships, and we had all this miscellaneous junk--but we never built a new one. Then finally in 1968..well, '67 I said to Malcom, "I want to go in business for myself, and I'm thinking about leaving," and he said, "You can't leave because we have a big program," you know, and so forth, and it was the SL7 program, which was the big high-speed 33 knot ship. He said, "You can't leave, we're gonna start ..." I said, "I really have made up my mind." And he tried to prevail on me to stay, but I left and went into ... [?] And that was the first big program ...

AG: They built the SL7's before ... [?] ...

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CC: Yeah, okay. My recollection is those two for Matson. And then he did two of his own. Two were built in this country and two were built overseas.

AG: These ships..in fact, Warren Lebach bought those two ships without proper authority. I think that was why he got fired...the Matson ships.

CC: He had a way of doing that, didn't he?

AG: Well, it was probably a good idea and that's all Warren needed....

CC: Yeah. [Later] he went ahead and it was a Lancer class, which were the U.S. Lines..some of those old, breakbulk ships that had been converted to container ships, and when U.S. Lines went bankrupt they went out for auction, and the terms of the auction was you could do a walk-around survey, but you really couldn't inspect the ships..couldn't go into any compartments, and so forth. So Primmi bought, what was it, four of them I think, and Sealand bought [?].

AD: Who would buy on those terms?

CC: This is Jones Act, they have to be American built.

AG: You can patch up an awful lot of junk before you paid for a new ship.

AD: So you're really buying that legal stipulation.

CC: Right. The banks were anxious to get as much as they could, and so they..and so [?] bought these ships and they went into that, that Puerto Rican Navieras Service. And the company was kind of slimly..I mean, traditionally losing money, because they had acquired these old Sun Shipyard ships..these terrible trailer ships that Sun Shipyard had built a series of. And they were trying to operate them and kept losing money and losing money, losing money. So they were deep in the hole..but the Puerto Rican government was bankrolling the company, because it was Puerto Rican government owned, okay? And PRIMMI was just a management group of ex-Sealanders--Ronnie Katims, John Moynihan, and Jerry Toomie. And Toomie was the president of the company; Ronnie had already left; John Moynihan had left, and Jerry Toomie was running the company out of New Brunswick here, because..and it had Warren as their vice-president of marine operations, senior vice-president. And Warren was still, like..he was Maritime Administrator, like he was an admiral, like he was a general, like he was his own thing, doing his

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own thing. And now come these new Lancers into the fleet and he has to fix them up. So he puts them into the yards to do overhaul, and he's got like a two-million dollar budget for each ship for major structural renewals, and stuff like that. And he starts getting into double bottoms and he finds them waste away, and he finds work under the boilers; he's already got stuff opened up, so he says, "I might as well go ahead and do this," and he runs up a 42 million dollar repair bill, without telling anybody. Meanwhile, of course, PRIMI, the management company was in hot water from the Puerto Rican government for continuing losing money, and going back and they would ask, "We need ten more million dollars to do this." And they said, "That's the end of it. You get no more money. You have to start making money." And now suddenly Warren comes and he says, "Jerry, here's a repair bill, 42 million dollars."

AG: Probably all this should have been done, you know? They never should have bought the damn ships. They paid too much for them, and, but, as you say, he wasn't authorized to do it.

CC: Well, the first thing that happened is Warren got fired for doing something unauthorized. The second thing that happened is Jerry Toomie got fired. I mean, a whole..the Puerto Rican Senate started an investigation. We, in fact, part of that, we were the investigators on whether there was..I mean, it was so bizarre that they said, "Something has to be going on under the table," or this is ...

AD: And was it all money that purchased real repairs?

AG: No question about it. Yeah! Warren is honest as the day is long. And so is the shipyard honest, as well. Of course, we knew ...

CC: Oh, yeah.

AG: Well, once you've opened up they gotcha, okay? I tell you ... And they'd tell the Coast Guard, "Come down and see this," and there's no way [you can] button it up again, they'll know, because ...

CC: We went through the thing with a fine comb, and there was not a penny out of..amiss, in the whole program. It's just, he didn't do it with authorization. But, I mean, it blew away that company. PRIMI just disappeared.

AG: And probably Warren had told them..yeah, when they set the budget at two million bucks a ship, I'm sure that came from

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Warren. It was just totally unrealistic, 'cause the ships were old and they were in bad shape.

AD: And all that repair didn't give the ships that added value, so you couldn't put them on the market and get that back?

AG: They're still operating. And then Ron Katims just bought the company, I gather. Or, it was a group of investors. But these are..these ships must be, what, 35 years old?

CC: And Sealand has the companion ships to these. And they're trying to do it with a similar amount..two and a half million apiece, and nursing the ships along. And I'm down in Puerto Rico on Superbowl Sunday, sitting in a bar, watching the Superbowl, talking to a guy. And he's having beer, I'm having a beer, and we're watching. And I said, "Yeah, how you doing, what are you doing," and so forth. And he said, "Yeah, I sail. I go to sea. I'm a merchant seaman." And I said, "Oh, you mean you sail on the ships?" "Yeah!" I said, "What's the name..what ship is it?" "Well, I'm on one of the Lancers, they just brought the ship around from the West Coast." And I said, "Oh! big ships that carry trucks on them?" He said, "Yeah!" And I said, "How is the ship?" "Oh," he said, "Man!" he said, "but let's have another beer." And so, "Man!" he said, "the trouble we ... we broke down seven times getting down the Mexican coast. Man! Let's have another beer." And then he..you know, and he's telling me what terrible condition those ships were in, and how they just barely got it around, and the company wasn't spending the money on the maintenance, and so forth. I mean, here it was Warren had done this. He spent the money to get the ships in good operating condition. And Sealand, of course, was just nursing the ships along....

So at any rate, so the period '60, 1960 or 1957 through 1968 was a period of conversions for Sealand. And they built a huge fleet of container ships, but all converted ships. And then in 1968 they launched into a massive new building program with Warren heading it up. And they went to Europe and they built these SL7 33 knot ships, Malcom's idea. And remember, at that time bunker fuel was a dollar eighty a barrel. It was probably one of the cheaper commodities. The fuel bill wasn't terribly significant in a ship's operating budget.

AG: It would fluctuate within a buck and two bucks a barrel; it was a residual..it was something you had to get rid of. You know, this was just the end of the refining process. So you didn't..nobody thought about it.

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CC: And, of course, in the refining process what you do, since crude oil consists of--in addition to petroleum--consists of salt water and sand and mud and ash and rock and salt and copper and vanadium, and all this other stuff, right? The refining process merely means, you know, heating it up, distilling it, and getting off the light end. And what was left over back in those years was residual oil, or, as they said in the 1880's and 1890's, since they did end up with a basin, they were the bunkers. You know, the stuff that was left in the bottom, or fuel oil, or bunker. It looked like this iced tea, here. It was pretty high grade stuff in the 1940's and '50's and '60's. And it wasn't 'til OPEC came along and jacked the price of oil up to forty dollars a barrel that the refiner said, "Oh!" you know, "we gotta get more out of this." So instead of just taking fifty percent out of the barrel, they were able to get it down to esoteric forms of distillation. And then, of course, through catalytic cracking and a lot of other esoteric methods, you know, they were able to get all but let's say 12 or 14 percent out of a barrel. When you're buying bunkers you're not getting the contents certified. One of the things that you didn't want was Vanadium.

AG: For Grace ships we specify low vanadium fuel and they would mix special fuels for those ships.

CC: But traditionally on a merchant ship, you got the garbage..whatever the refinery manager that day decided to throw away, that's what you got. And it could be pretty, you know..well, it would be the bottom of the barrel. But it wasn't such bad stuff, as compared to what you get today. Today, when you take 12 percent, all but 12 to 15 percent, what you're left with are all the rocks and all the salt and all this other stuff in there.

CC: So what happened is Malcom designed these 33 knot ships in an era when high-quality fuel for nothing--it was almost free by today's standards--and during the construction and after he built the ships OPEC formed and the price of oil jumped, you know, twenty fold. And suddenly having ships that were 180 thousand horsepower each--120 thousand? No, eighty thousand. A hundred eighty thousand ... They're incredible, you know? The eight ships in the fleet, if they were all operating at full speed at sea, their daily fuel bill was a million dollars a day. So suddenly the ships became--at least at 33 knots--obsolete. They were a great idea when fuel was cheap, but once ...

AD: They were taking on a Navy style power plant ...

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CC: No. This is what I hate to say, and I, you know, I don't want you to say anything in a derogatory way, but Warren had working for him a Ford engineer, a very ignorant Ford engineer. I won't even mention his name. But a fellow who was not honest, who was later investigated by the Department of Justice for a lot of irregular activities, and stuff like that.

CC: This particular person was really scamming the company and doing illegal things, very..in a big way. He had had no technical..the full extent of his technical experience was being a port engineer up through the hawse pipe. And what they put in those ships--and it was on his advice--what they put in there is what I would call the world's biggest victory ships. It was a victory ship plant. Same steam conditions as you'd find on a victory ship. I mean, you know, it was just terrible. Very inefficient plant. Foster Wheeler built the boilers.

AG: Even though the ships were built in Germany.

CC: Germany. G.E. turbines, Foster Wheeler boilers, and the ships were built in Germany and Holland--Rotterdam Dry Dock and I think it was.

AD: Now they were built in Germany. How were they to be flagged?

AG: Well, American. See, he wasn't subsidized. Malcom could do things like that. No requirements on his foreign trade. He couldn't use them coast wise, but he had no intention of [doing so].

CC: I was on an R2CL cruiseliner last week doing an investigation on the subject you'll probably read about in the papers at some point. And I have a video camera, and the ship came into Puerto Rico, into San Juan. And I'm taking a picture of ... La Grande and Puerto Nuevo, you know, these container areas down there over the railing. And the wind's kind of blowing, it's a kind of brisk day. And the next thing I see through my little camcorder as I'm trying to take a picture of the shoreline, is here comes a hat flying by. And it goes right over the side. And the next thing, here comes this bald guy running after the hat. He said, "My hat! My hat!" you know? Then a few seconds later he goes by me and you hear on the video tape, "Ah, shit!" ... [laughs] And it was so funny. I mean, I got home and I was playing this tape at home, and I'm..the sequence ...

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AD: Now, we move into new construction. Was McLean the first to build ...

CC: No.

AD: ... new construction of container ships?

CC: Now at this point, remember he was very strapped for cash. He was constantly expanding, expanding, using other people's money. He was trying to get as much container space afloat in service as he could for his limited dollars. And so he wasn't looking to build fancy.

AD: Was this part of a strategy? I mean, did he tie up all the business and then he'd new build?

CC: No, it was just ... He recognized he couldn't tie up all the business. But, they never wanted to tie up it all. He said it was bad business to kind of monopolize the business. He had some very interesting management philosophies.

AD: I'd be interested to hear whatever you'd say about that, because ...as you look at it from a distance, there are different styles here.

CC: Several of his bon mots or his precepts, if you will, at least..I think one was that the shipper will always go to the lowest cost carrier. You can offer whatever kind of service inducements you want, but if somebody offers service at lower cost ...

END TAPE 2 SIDE A. BEGIN TAPE 2, SIDE B

CC: ... give everybody a fair deal. Don't come back and say ... we want to establish some relationships in a one-off deal ... Everybody deserves a fair price. And things like that. What we were talking about before--and I don't know whether I developed the idea or completed the idea--was that one of the advantages I thought that Sealand had, and some of the others had, was that conversions during that period of time--1957 to '67; a ten-year period; like the first ten years of Sealand--it wasn't so much that he was able to get the ships cheaply, but he was able to line up these programs into effect so quickly. In ninety days to 180 days we did a lot of conversions in those..it was almost like under wartime conditions. We would rush out and order cranes and some stuff like that. We'd work around the clock, and we would..and we'd have those ships in service in three months or six months. It meant that if he sensed a business opportunity, needed more capacity in the trade, saw new

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trades he wanted to go into, and so forth, he could respond very quickly. Remember, at the same time a subsidized operator would have to go to a naval architect, have a ship design. That could take anywhere from three to six months, you know? They'd agonize over it, and it would go to the ... [Navy?] ... and they would agonize over it. Then it'd go to the Maritime Administration and they'd agonize ... So a year later you're still talking about the same dried-out, old ship, right? And then you go around and bid it to the yards, and that whole procedure would take a lot. Then the yards would take a year and a half or two years, a couple years, to build the ship. So from the point of inception of an idea--sensing a need--to the time you could put ships in service, you could be talking about a two and a half, three year program.

AD: Or more.

CC: Or more! You know, then the ships would come striked out [?] ... So here's Malcom, if you know, like a bantam weight, hopping around, knocking ships out. And admittedly they weren't very pretty. But, you know, three or four or five months and he'd be all set up and in service, and ... So he was able to move fast. And those two ships we talked about--the Eleana and the Leonore, from Sea-Land come the Ponce and the Mayaguez--he put those in that service down there; one month after we were in service, he called us all in and said, "I made a mistake. I blew it!" He said, "I blew it!" He said, "We have to take these ships out of the ... there isn't a cargo here for it. Redeploy those cranes, get the cranes and that equipment off. Charlie, you change the ship's so-and-so. So-and-so, you take those containers we've got and move them out." And a week later that service was abandoned and he had them redeployed. But if that had been a subsidized operation he'd be agonizing for a year to get that thing changed. So, some of those early successes, I think, can be ascribed to being able to quickly respond. And I think even faster than you find, for example, European companies able to respond. You know, European companies operate differently than American companies. They..shipping companies. They operate almost on the committee basis. You had this ring of top men ...

AG: [European] companies are no bargains. I mean, they didn't have subsidies to contend with. But they were pretty archaic.

CC: You had this ring of top managers ... Take, for example, companies like Hamburg [?] or Hapag Lloyd, or so forth. You know, you have maybe four directors or five directors, each

with a different area of responsibility. No one of those directors will make a decision without getting the approval or the agreement of the other directors. And there's an awful lot of log rolling. I mean, if you agree to my change, I'll agree to yours ... So they agonize, and this consensus building doesn't lead 1) to the most efficient decisions, and 2) it doesn't do a very fast decision. So here's..now Malcom dancing around, you know, opening services and closing services, and personally involving himself. He's saying, "Let's go to Europe." At that time--and you can appreciate this, Andy--at that time in the company there weren't three people who had ever been to Europe ... [laughs] ... You know? He comes to me! I had to be one of the most junior people in..and he said, "Charlie, where do you think we ought to serve, what ports?" you know? "We're gonna serve Europe. Where do you think we ought to go?" You know, this is not operations research ... And I said, "I think you ought to go to Rotterdam." And, in fact, Shwartow, who comes from that stevedoring family that goes back hundreds of years and the fellow who formed ECT in Rotterdam, had written a letter to Malcolm back in '61..'60, or to Nelson Rogers, and said, "I been reading about containerization. I know that someday containerization will come to Europe, and we hope that you'll come to Rotterdam, because this is the place you ought to come to." But there were people at Sealand didn't know where Europe was, and so forth. So they started sending all of these, you know, yahoos, you know, from Texas and Tennessee, and so forth, to Europe, to learn about where Europe was. And they were like real cowboys over there.

We found Europe. And so the first ship sailed, it was the Azalea City, and it sailed ... for the U.K. with not very many ... maybe twenty containers, a couple hundred capacity, but maybe twenty containers. It goes up to Grangemouth up in Scotland to load whiskey, right? And containers.

AG: Yeah, Malcom invented Grangemouth... never even heard of the place.

CC: ... and Cunard Lines, and a few of the others go around to the distillers and said, "If you ship one load on a Sealand ship," you know, "we'll never carry another one of your products." Every one of the distillers went absolutely crazy out of nervousness that they were never gonna be able to ship..you know, they were gonna be boycotted, and so forth. And so nobody would ship ... except one company, J & B. J & B said, "Screw you! We're gonna try it out."

AD: Good Scottish attitude toward the English...

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CC: So, well, and then the English came by and said, "You can't carry these containers, because maximum highway length is thirty-three feet. So you can't put your chassis on our ... [roads]." And Malcom said, "Well, what changed the law, because ... [?]" "... [?], but for you we're not gonna do it." And he said, "Okay," he said ... "Bye, bye, George. Nice to see you." Malcom said, "What if I had a telephone pole, I wanted to move a telephone pole from Edinburgh to Grangemouth. What could I do?" And they said, "Well, you could carry that out on a flatbed truck." He said, "Well, what do I have to do?" He said, "Well, if it hangs over the edge you gotta tie a red flag on the back." He said, "Okay." And so he took his containers and he put them on flatbed..thirty-three foot long flatbed trucks, and he tied red flags on them ... [laughs] ... And then he went back to this guy and he said, "Do you think that's safe? Do you think that's better than running them on the chassis?" And that was the change of the highway laws. But he had a tough time for the first two sailings. And the minute one or two of those distillers gave in, they all gave in. And the next thing..and that was like a watershed. I mean, then Cunard and the British and OCL and U.S. and they all said, "Well, we better get in this business. We better take this seriously now, because there goes our whiskey business."

AG: [They tried bulk shipping of] whiskey for a while.

CC: In tanks.

AG: Yeah, yeah. Bulk containers. They were eight by thirty-five by four feet high, ... carry ...

CC: Twenty-thousand gallons. Well, we carried a lot of stuff in there. Actually, in the [tank container] service we carried tetraethyl for lead ... a very dangerous lead additive for gasoline back in those days. And then, they proved to be very effective containers. You could put two in one container space. They were heavy. And then we started building more tank containers and we were carrying..in the European service it turned out that all kinds of trade started appearing that didn't exist before. For example, Chicago, you know? I mean, the Europeans go crazy for sausage, right? It's a religion for the Europeans, sausage is. And you need offals for that. So here, coming out of Chicago, would be all of these tankloads of offal. So they just loaded these tanks and shipped to Europe... Moving across the country or on the intercoastal service was California lettuce. You used to..I mean, you'd go to a restaurant in Paris and you'd get this boiled lettuce, you know, and it was really terrible. Suddenly iceberg lettuce

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started appearing on the tables in Europe... It was California lettuce because the cycle time from the field to the market, les halles, and the other markets in France and Europe was so short, now, that suddenly things that were perishable--avocadoes, for example, up in the New York market. The only way we had avocadoes up here would be that they were flown in. And they were very expensive.

AD: This produce is moving refridgerated?

CC: Yeah, most of it was moving either in..then later in controlled atmospheres, and things like that. But suddenly avocadoes started appearing up here at half and a third the price, because of ...

AD: See, that's an aspect of the story I really want to lean on, because you don't just steal old markets, you create new markets.

CC: That's what was happening. It was happening for several reasons. One was because the container could do things that couldn't otherwise be done. And the second thing is that containers was producing economies that hadn't existed before. So suddenly things became competitive in a new market because of it. I mean, when you start thinking about what were the advantages, the traditional advantages. Well, I think one of the big things was packaging, for example. I mean, if we think about the way we used to package, say appliances..a refrigerator for export. Package a refrigerator ... if you get a gang of carpenters out there, and they would build a chicken coop, and you'd put the refrigerator inside the chicken coop and ship the chicken coop. But, the packaging that used to go in it. Now suddenly..or even whiskey. I mean, Haig and Haig, for example--and I got familiar with the way whiskey got packaged--but the Haig and Haig bottles, Haig and Haig was one of the more expensive whiskeys--those were works of art, those cartons, crates, rather, that they came in. Well now, suddenly, you could ship the cheapest, simplest carton, you know, where it used to be very expensive packaging. Then the damage. I mean, when we talked about the Grace Line Piers, U.S. Line Piers, and a lot of those people..one of the standard groups on there and a certain portion of the pier, was dedicated to the coopers, right? And the coopers had the job of sewing bags back together and re-freighting things, and reassembling stuff that got damaged, and it was a very ...

AD: Oh, I see, it was a generic term. It wasn't just building barrels.

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CC: Not at all, no, no. Well, they were cooper's union, but I guess they were carpenters.

AG: The ones we had were Italian old-timers who were very good craftsmen. And barrels, there was very little barrel stuff. But it, you know, we'd build all kinds of boxes. They had all kinds of lumber there, and the Coopers were pretty good.

AD: It's just like the automobiles, where they used to produce junk cars. Every sixth one had to be cleaned up at the end of the line, you know? And then they wised up and they said, "You don't produce junk," and, "Get rid of all that repair work."

AG: Well we, you know, we brought all this Chilean fruit up, and although they were wooden boxes, they were very light weight and they were easily damaged. And these guys were repacking fruit all during the fruit season.

CC: So you save on the packaging, you're saving on the damage to the cargo, you know? And now suddenly it wasn't getting damaged. Even fruit wasn't getting bruised. Let's see, when I started sailing with Grace Line, they used to load the..what would happen is they would open the side ports of the ship down in Ecuador, for example, and they'd bring barges alongside straight from the plantations, right? And tie the barges to the side of the ship, open the side port, put these big planks up, and almost the way the Phoenicians and Egyptians loaded ships, the longshoremen down there would put the stem of bananas on their shoulder, a burlap on the shoulder so they wouldn't get bitten by the snakes and the spiders, and so forth; and carry the stem up the ramp and stack it in bins, portable bins that had been erected in the refrigerated holds, and be given a chip for having taken one stem. And as many stems as they could carry, they would be paid for. And then when you'd get to this end--the East, or the Hudson River or the North River--they'd come off pretty much the same way, until things got a little more automated. And that fruit, because of the handling and re-handling, would get pretty badly bruised, you know? And so an awful lot of produce that was in transit--not just bananas, but deciduous fruit and grapes and apples, and from Chile and South Africa, and so forth--would get banged around pretty badly. And now suddenly it started moving in containers, right? And once it was put into containers..and usually packed in the fields, you know? It never got this kind of rough treatment. So your your packaging was cheaper, damage was less, insurance was less, the pilferage, as we said before, now it's a lot harder to pilfer the cargo. So suddenly these tremendous pilferage rates were

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starting to disappear. The handling and re-handling..the number of people involved in the cycle on the pier--the checking, the counting, the documentation--became simpler. And the productivity of the ship became great. So all of these, you know, had a tremendous impact on the cost of containerized ...

AD: I see the point you're making and retrospectively this is so evident. I mean, there are savings to be realized everywhere. But it was not evident then, and some perceived it and some didn't. And what really intrigues me is trying to capture [these perceptions] ... it may just be individual. But if there is that kind of cultural group that could see this, and another cultural group that couldn't see it, then it would be nice to be able to identify them.

AG: Well, there are a lot of forces coming into play. You're talking about [shipping] refrigerators. The manufacturers in this country, who realized it would cost them a hell of a lot of money to put this in crates, were insisting that it be shipped in domestic packing--use heavy cardboard box just like you have today. And if you damage them, you aren't gonna get it anymore. I don't know what they were gonna do with them. So the claims were horrendous. We started tracking [?] to pallets, and all this sort of stuff. Finally, some smart guy in--I guess he was ... [in] Venezuela--set up a showroom where he had all the models of refrigerators. He had a warehouse in Miami. You would buy a refrigerator; they would fly it to Micatia, which was the airport, and you could have whatever you wanted in a week without a scratch on it. And the claims were such and the costs were such and the stevedores were such that he could afford to fly this stuff..and we were, you know, on the short end... the manufacturers weren't that stupid. I mean, they were getting smarter ...

AD: That's how capitalism is supposed to work ...

AG: Exactly! But it did! And then, of course, all of a sudden they got it back because the airlines couldn't begin to compete with a container. But let me ask you ... Charlie: Malcom used to talk a great deal about calculations on the back of an envelope, and I had a sneaking suspicion that that wasn't all apocryphal, that some of it was that simple. I mean, he would go for slot costs that he could calculate very quickly and make spot decisions with no more OR than the back of that envelope. And that happened, didn't it?

CC: Yeah ... [laughs] ...

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AD: Let the record show that Charlie shook his head yes.

CC: Yeah, because I say he [was] very proud of this, you know? People say, "Nah, nah, nah, that was just Malcom talking." "No," I said, "I don't believe it. I think that's the way he made decisions." And on an up market he had a pretty good margin of error, okay?

AD: Yeah, you don't have to be brilliant and you don't have to be precise, but the point is you're quick.

CC: Quick ...

AD: You've made the decision and you move. It's like your ships.

CC: And ... when he first came in to a trade, once you gave the shipper a taste of containers, you're talking about the lowest cost container carrier. Because you couldn't give away breakbulk. For a lot of guys, once he had a taste of container, forget it! If it isn't going in a container, don't take it, okay? I mean, his life became simple. Imagine, the truck would show up at your plant. You weren't arranging with the truck driver to take it to the port, who would then put it in a warehouse, then would store it, then would take it with another truck driver, and then the checkers would check it, and then the Coopers would coop it, and the ... clippers would clip it, and ... you know. I mean, here is one guy taking it off your hands with one document. And the next thing it's gonna show up at your consignee. By the way, faster, sooner, with less cost and, you know, and suddenly ...

AD: Was the single document part of it from the outset?

CC: Not from the outset. But that was a big breakthrough ... If you could know what the documentation process looked like back in the fifties ... I mean, when I said there were two pursers on the ship, they were two pursers on the ship working their ass off, typing manifests and shipping documents and, you know, and all these custom's house declarations ...

AG: And the purser had to get it [all done] before you get to the first port so you could discharge the cargo.

CC: Yeah. And so the documentation was really primitive. It probably hadn't changed anything different than the old trailer days in sailing ships.

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AG: Not a damn bit! In fact, if you look at the back of a Bill of Lading today, it was written when these things were in their infancy.

CC: So the documentation side, I mean, you know, I'm a technologist and an engineer, and so maybe I'd focus on and think about the hardware end of it more. But, you know, even the paperwork side of it was a tremendous boom for the, to the shippers. And so up and down the line there were so many advantages--care and custody of the cargo, the condition it turned out, the cost of shipping it, the efficiency of the modes--all of these different things were all tremendous advantages in containerization. There were others, too. For example, in the old days you could sit and you could see a ship on the horizon--Andy, you'll appreciate this--and you would know generally--if you were a real seafarer--you'd know what ship that was, what company that was. You certainly could identify the nationality of the ship by its ... [features]. British ships always had coaling hatches midships; many companies had distinctive features to their ships, and so forth... stack markings. I'm talking just the silhouettes, you know? I mean, every ship was particularized. The ship that was in the banana trade looked different than a ship that was in the, you know, West Africa coffee trade, that would look different than a ship on the North Atlantic. And so, cargo ships and breakbulk ships were very specialized ships. Now what you came along with was the container, the great common denominator, you know? The only decision you had to make is are you gonna make it twenty foot or are you gonna make it forty foot. That's about the only decision..and, by the way, two twenties equals a forty, so ... And suddenly the ship didn't have to be any different if it was a reefer ship or if it was carrying refrigerators or tomatoes or whatever you were carrying, it was the same ship. So suddenly container ships started to look standardized and became standardized. And you lost a lot of the particularizing features that you had in breakbulk ships. And the reason..

When I left Sealand ... that was a period of time when a lot of the liberty ships of World War II were wearing out, and they were getting replaced. And there were a series of programs--a few in Europe, but particularly in Japan--where they had whole liberty ship replacement designs, the Freedom Class, for example--Freedom 1 and Freedom 2--were an IHI design, and it was meant to be a very austere, low-cost ship that would replace a liberty ship for Greek owners, and things like that. And the Europeans, the British had the ST14, for example. And there were others in Europe. And I said to myself--but these were breakbulk ships replacements

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--I said, "There has to be a container ship equivalent to the Freedom Class or the ST14. And because there are so few variables left in the container ship, there can't be too many different sizes even. You can just come up with a certain number of ships. I wonder if we can sit down and we can design them all as a series, every possibility going from 200 containers up to 1000 containers." So we came up with what we called our econ ship, our economical container ship. And it was meant to be an austere, ship-building friendly, very simple, you know ... Not a high-powered ship..automated, you know, motor ship.

AD: This is after the SL7's had been designed?

CC: Malcom was doing the SL7's over there at Sealand. By this time I was in business for myself. And we were in the first year and we were looking for things to do, as well as, you know, scrounging around for projects.

AG: Did Malcom dictate the power on his econ ships?

CC: No, he dictated the speed. He didn't have a clue as to what the power ...

AG: Okay, the speed. In other words, he settled for the low speed to fit into his formula ...

CC: No, the high speed, 33 knot.

AD: He's going to the econo liners ...

CC: Oh, the Econ ships?

AD: Yeah.

CC: Oh, no! This was..no, I'm talking about long before the jumbo econs, no. I'm talking about a whole series of ships that we built in Spain--we built them in Japan and so forth--called econ ships. We built ...

AD: For whom?

CC: We built five of them for ... Edubijon [?] We built ... the first Spanish company called Transatlantica, we built a couple for them. So, we started building these things we called econ ships, which had no tumblehome, it had no flair, which had no camber, which had no deadrise, which had no ... They were just simple, simple ships. And the market started to grab onto them and we made ... Yeah, it had some features to it. But it had, it was automated. It had a slow speed

...

AD: So it was possible to specify technical optimals that would capture the market. I guess I had no idea that had been done, because the SL7's were fast and then the later econo ships were big and slow.

CC: See, we got criticized and, "Why are we building," and these were eighteen knot ships, these econ ships. Eighteen knot ships. And we did an analysis of the whole market. And they weren't but one percent of the ships that were over twenty knots at that time. We're talking liner ships and breakbulk ships. Everybody was talking high speed ships, but nobody was willing to spend the money for them. So, the econ ships were apparently the right speed. Now, I'm talking about not the big, you know, jumbo econ ships. I'm talking about ships with 2,000 TEU capacity, or 1500 TEU capacity. Then it turned out that there was a lot of need for ships doing line haul service. And remember, these ships were going from Port A to Port B, spinning coming back, spinning going back, and so forth. But you still needed the pick up and delivery service. You need the little trucks to take the stuff to the depot where the big trucks were. And so, when I was still at Sealand I was sent on missions to go out and find little ships, German coasting ships, and stuff like that, that we could put containers on that could do feeder ship work. And I said to myself, "We need a standard feeder ship, too." So we developed this econ Peter Series, which quite a few of those ships ... up in New York and the Far East. And again, what we found is that the optimum feeder ship for the..southeast Asia was the same as the optimum feeder ship for the Alaska service, same as for the Baltic, the same as for the Med, and so forth. In other words, a container ship--coming back to this point--was the great equalizer. Suddenly you didn't have to particularize the ship. You could take a ship that worked well in the Persian Gulf and put it in a South America or the Caribbean trade. And you could move it up into the..it suddenly wasn't a hybrid ship for a particular area.

AD: But one reads in the technical literature, which I don't read a great deal of, about the generations of container ships, which makes it seem that there was more of an evolutionary standardization than what you described.

CC: No, when they talk about the second gen and third gen or fourth generation, they're talking about evolution in size, only size ... got bigger and bigger and bigger. And, of course, when Malcom came along with his concept for the jumbo econ ship, it didn't really start as a jumbo econ

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ship. He had some left-over vessels where he felt the stern had some value in them, but the fore-bodies were all shot, you know? And he said, "Let us build the most humongous forebody we can and hang these sterns on them."

AG: Was this the Mariners?

CC: C4's. No, they were still C4's.

AG: The Aquarius Class he built at Sun?

CC: Nope, they were C4's. They were welded ...

AG: We're not talking about U.S. Line. We're still at the Sealand?

CC: No, I'm talking about U.S. Lines. But before the jumbo. The evolution of the jumbo econ ship came about when Malcolm said--and we were invited to actually ... talking along these lines, that ... [?] was still at Sealine. But by the time he got..and he had a card, U.S. Lines, and sold to Sealand interests, he was looking at ... No, wait a second ... I take it back, no. He was at U.S. Lines and we were either talking Lancers or Leader class ships.

AG: Yeah, 'cause the Lancers were the ones built at Sun ...

CC: Yeah. And the Leader class were the Mariners, right?

AG: Yes.

CC: Okay.

AG: And then McMullen..I remember McMullen wanted to convert them and I said, "Nah! They're too bloody old!" He said, "No way. Ideal conversions." And they certainly were.

CC: So he had these sterns and he said, "I want to build a Panimax forebody and we nicknamed the program The Rat and the Elephant. The rat pushing this big elephant, you know? And we came up with..we came up with a design to hang a C4 stern on a humongous forebody, you know? And we had this wedding cake of a superstructure so you could see over the load up there, and it was horrible. I mean, it was a good thing it never got ... But the point was we got very far along with that program and he got more and more excited about it, and so forth. He couldn't get the financing for it ... fortunately. He got more and more excited about it, and then he came to the realization that the stern that he was hanging on there didn't represent a very significant

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part of the total ship. And certainly when you talk of the equipment and the ports, and everything else, the sterns were a totally insignificant part of the whole thing. So he said, "Let's do the whole thing." So then we designed a new stern, keeping the ship Panimax within 950, at that time 950 by ... [?]

AG: Did he decide on the speed of those ships?

CC: And he decided on the speed. He said, "You know, this is crazy to push the cargo," well, \$40 barrel of fuel. And, you know, to pick up one or two knots, or three knots, you double the cost, you double the size of the ... [powerplant ?] ... And if you look at the operating cost of the ship today, fuel represents the largest single operating cost, well ahead of labor, and so forth. So to double the power-- in other words, to double the fuel consumption--is really to put a tremendous burden, you know, onto the total, around the bottom line. So his attitude was eighteen--eighteen or eighteen and a..eighteen knots will do it, you know? And we prevailed upon him to put a little more reserve in it. In fact, when we delivered those ships they were nineteen and a half knot ships. Everybody talked to ... eighteen knots. And, of course, everybody has been afraid of Malcom, with his SL7's, when it came with containerization. And during the construction of those ships, he feels it was a conspiracy, and I don't even doubt it now..the Europeans and a number of the U.S. companies ganged up, really ganged up hard against him. Certainly there was a lot of adverse publicity when the ships were under construction. Fairplay called it Malcolm's Big Canoe, and..you know, and they mocked the ships and so forth. And it wasn't until the ships were delivered..in fact, performed and performed beautifully..you know, from the first day.

AG: But then he couldn't get any cargo ...

CC: Well, no, he ... The curious thing is he built twelve ships in record time ... Sorry, Dai Woo [?], and when he came close to delivery of the first ship, he told us, "I want those ships out of that yard a month and a half early," and we said, "We're not finished, 'cause we got a whole list," and he said to do everything that has an impact on seaworthiness. But if it's cosmetic, if it has painting..if it's not affecting seaworthiness, I want the ship..we'll make two ships ... we'll put it back and we'll finish the ships afterwards. So we sailed the first ship, the American New York, out of Dai Woo with a list of 480 unfinished items on it, so that he could capture the transpacific Christmas cargo. He made two voyages. On the first voyage, I think

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it was a record revenue voyage for any cargo ship, all time, ever. And he practically paid for the first ship in two voyages. It was phenomenal!

He just ran them back and forth. But in trying to build those ships..I mean, we looked at a lot of yards around the world. We went, for example, to Harlan and Wolff in Belfast to build those ships. And British shipbuilders were willing to meet the Korean price, and subsidize it, and everything else. I mean, they were anxious to build those ships, but they couldn't deliver the..they couldn't deliver enough ships fast enough. And you can't run a bus line, or you can't run an airline with one bus, or one airplane. You need a whole series. So Malcom said, "I need them at, you know, at least at three or four week intervals." And they said, "You can have them at three or four month intervals," you know, and it would have taken him several years to get them out of Harlan and Wolff, so one of his reasons for going with the Koreans was to get those ships. Well, when he finally got enough ships to deploy his around-the-world service, then he threw them into an around-the-world service. It took him so long from the time he conceived of this--to get it financed, to get it built, and everything else--that the transatlantic service had deteriorated; it's always been a ... [?] anyways. The project cargo that was moving from Europe down into the Persian Gulf with those Arabic countries building new cities and building water desalination plants and aluminum plants and so..that all dried up. That project cargo dried up. There are no targeted moves, or very little that moves Middle East up into Asia, right? And then the transpacific service was a big rate war going on, and is in a coastal service from the West Coast around to the East Coast was being captured by the landbridge. So suddenly what had been his around-the-world dream, with a ship sailing every week, with 12 ships, you know, suddenly turned into a total nightmare from a cargo acquisition point of view. And all of the things that he had been famous for all of those years--you know, being quick and redeploying and.--suddenly didn't happen. He had surrounded himself with a management group that included a number of people in his family that maybe didn't have the same transportation talents and management talents that he had had amongst his early group of executives. He had locked himself into an around-the-world trade that had been a dream of his, and he maybe was reluctant to surrender that dream too fast. But whatever it was, because of the size of the ships and the amount of dollars that were flowing, and everything else, things happened awfully fast and drained his cash away, and he went bankrupt.

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AD: But you say that, or you believe the ship design was good and there was nothing wrong with it.

CC: The ship design..it's been the backbone of the Sealand fleet now ...

AG: Now they downsized the ship, didn't they?

CC: On three of the ships. And for the life of me, I and a lot of other people cannot figure out why they did this. What they had ... What they said is, "We need a twenty-two knot ship," all right? The ship is nineteen and a half knots. They wanted a twenty-two knot ship. So by cutting three hatches out of the ship--shortening the ship--and by reshaping the bow, and by adding power onto some generators and diesels and putting a motor on the shaft, and by going to a lot of contortions--they upped the speed of the ship two knots; at a little over twenty-one knots out of the ship--went from nineteen and a half to twenty-one knots with ... And they did it to three ships. But the other nine ships remained..and then, of course, they sold these ships. First of all, they were able to put them ... [?] reportedly for fifteen, but it was really twelve million dollars a piece. Twelve million dollars for the biggest dry cargo ships afloat. You couldn't have built a ship for fifty million here.

AD: And what did Malcom pay for it?

CC: He paid in the yard, they were under budget; we had contracted for around forty-eight and they came at forty-five.

AD: And when Sealand got them they were how old?

CC: They were about four years old.

AD: Hmm, it was obviously a big bargain.

CC: Oh, yeah! For twelve million dollars apiece, you know? And so, they put them into service and they retired an awful lot of their small tired-out junk. And then they started space sharing. They sold a lot of the ships--some were owned by the bank--but they sold a lot of the ships, you know, for a lot more than they paid for them.

AD: Is this generational growth in size nearing an end?

CC: No, I don't think so. You know, everybody says, "Well, that's it, now," you know? "We've reached the supertanker

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now." But ...

AG: But nobody's built one that big.

CC: Oh, sure they have! There's over a hundred now in service.

AD: With six thousand TEU?

CC: No, those are forty-four hundred TEU. They were Panamax. But now what you're finding are post-Panamax. So while everybody sat there and said, "Oh, this is gonna kill the business and it's oversized and it's a behemoth," and everything else, the next thing they did was imitate him.

AG: Who beside APL has built post-Panimax?

CC: Everyone! ... let's see, OCL, the Japanese lines have done it.

AG: But the fact that they don't have to go through the Panama Canal, they probably got a more seaworthy ship. I mean, it isn't as deep.

CC: Yeah, because even the Panamax container ship still carries, when you pile all that cargo, it still carries eight to ten thousand tons of salt water. And the freight rate on salt water is very low these days.

AG: Just for ballast, you say?

CC: So to carry ten thousand tons of salt water to Japan and then to bring it back again, and then to take it back ...

AG: Well, that's just because the cross-section of the Panama Canal isn't a good ship design ...

CC: Well, not if you're gonna pile, not if you're gonna pile cargo on deck.

AG: But they make a very long, narrow ship. There's a..you know, there's a speed-length ratio that Charlie knows about that I don't. But there's a, you know, there's a happy way of configuring ...

CC: Well, I would say that, you know, in the era of World War II and afterwards, and the Mariners, and so forth, we the naval architects and we the technicians and hydrodynamicists got hung up with hull form and built very narrow ships. And a broad-beamed ship is anathema. I mean, you wouldn't even think of doing it. If you looked at the standard series,

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the series 60 and ... go through the Panama Canal ... or the Manchester Ship Canal, or whatever. But, you know, it was all long and narrow stuff, you know? And people never carried cargo on deck anyways. Basically ships carried their cargo two-thirds in the level hold and one-third in the 'tween decks, right?

AG: Except for Grace Line. We were loaded on deck!

CC: I know, they would carry locomotives and all sorts of stuff. But generally speaking--I'm talking breakbulk ships in general--it was all, you know, in the hold and in between decks. And you didn't really [worry] too much about stability, because the ships were always usually fairly stable, and so forth. You had to watch what you were doing. But stability wasn't a big deal. Now you come along with container ships and you start piling stuff high up on the ship, stability became an important factor. But people still continued to build narrow ships. And so one of the features of the econ ships, for example--the jumbo as well as the econ feeders, and so forth--is they had a broader beam to length ratio than usual, and people said, "Ah, you can't do that!" Well now suddenly today everybody is looking in the direction of broader-beamed ships. And even the post-Panamax ships, where we've abandoned the necessity of having to transit.

AG: The first thing I did ... in the class was put in about twelve or fourteen hundred ton of thick ballast. That thing was so tender that when you let go of the lines it went ... So we carried big deck loads ...

CC: I don't doubt that.

AG: And, so it just scared the hell out of me, and we just piled it on ...

CC: You know what happened at the Gateway, in the Gateway City class? They had two of these shipboard gantry cranes..you couldn't put two trolleys over the side at the same time. They had traffic lights and one longshoreman's job was to stand on the bridge with red and green lights to tell the two crane drivers whose turn it was to be over the side.

AG: Because you're moving so fast you couldn't pick up any ...

CC: And they couldn't calculate the stability of the ship fast enough when it was time to sail, and so forth. And here were trucks arriving, right up to the last minute, you know. And Sealand was doing, taking a lot of the stuff from the

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garment district and midtown Manhattan, and it would go in containers to Puerto Rico, where they would hand stitch and put button holes in and tie the things to the brassieres, and stuff like that. And so there was a lot of labor work down there. And so these trucks would come on Friday afternoon and Friday evening, right up until sailing time through the gate and you wouldn't calculate the stability..couldn't calculate the stability 'til sailing time. So the way they used to judge the stability sometimes is that when the crane would go out over the side and you'd hook into a container and you started heaving on that container to pick it up, and the container wouldn't come up but the ship would come down, you know? And you kept pulling the ship further and further over ...

AG: Sound like the Vasa.

CC: He'd say, "Maybe we better shift some of these containers around and put the heavy ones ..." So stability was an issue, broader-beamed ships evolved, and there were a lot of other features to ships--higher freeboards, you know, protection up forward, breakwaters, and all kinds of little features that evolved to make the container ship..and, of course, the one that Andy mentioned earlier is the very open design of the deck.

AD: Hatchless ships.

CC: Central Gulf and Jerry Goldman, for example, and ... architects back in the late fifties, early sixties, had a breakbulk class of ship which they called the all-hatch ship, you know? It had three hatches abreast and so forth. And they were so proud of that ship. But it really didn't have a very big opening on the deck, but it was so much more than normal breakbulk ships that it was considered radical and a real breakthrough. Well, now today, with container ships you have virtually no deck left. So that means that torsional deflections in the ship--if you take a shoebox sometime and take the lid off the shoebox and just take the ends of it and twist the ends of it like this, and place the lid on the shoebox and see if you can twist it, the effect of that closed structure, that lid on there, is so dramatic, you know? The same thing went with, goes for ships. When you take a container ship and you start twisting it like this, torsionally it's very limber. So we had to approach the structural design of the ships. So there were some features to the ship that ...

AG: A few years ago some people were coming out with no hatches. In other words, they would just leave the openings. But

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that didn't really ...

CC: That's caught on, yeah.

AG: Has it?

CC: It's called the hatch coverless ship, or the hatchless ship, or ... It goes by a group of different names. And a group of Australians tried to patent it; in fact, have patents on it. Said nobody else can do this. But it depends. They're somewhat restricted ...

AD: You just have big pumps down to let the water come down and pump it out?

CC: Yeah, that's it.

AG: And then they carried the cell guides right up to the top. Is that pretty common?

CC: I wouldn't call it common, but there are enough of them around to say that there are a lot of hatch coverless ships.

AD: Do they carry a topsides up to the top of the load?

CC: Yeah, they raised the sides of the ship so you have very high freeboards around the side.

AG: It's just corners, not solid. It isn't like a solid hatch covering coming up. It's just the corners.

CC: It's really the cell guides extending all the way up.

AG: In the early days we lost a lot of containers. But it was waves over the bow.

CC: So the first few hatches on these hatch coverless ships do have hatch covers on them, or you have the superstructure forward, or you have something to protect the forward end, because you do ship green water even on the big ships, although not the jumbos. But when you get a little bit further aft you don't get water into the hatches. The Coast Guard and a regulatory body reluctantly [allowed us to] go one step at a time. It used to be that hatch covers had to be equipped with a seal all the way around, a gasket all the way around. And you used to have to have a clamp every three feet. And these were clamps that were all around the hatch cover. And they were maintenance nightmares because they would rust out and you couldn't repair them. There were always containers on top of them and you couldn't fix

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them in port, and so on. And so, one of the breakthroughs in little design at Sealand is I went to the Coast Guard and said, "We want just one dog at each four corners of each hatch cover." "No, you can't do that," and so forth and so on. Well, we've never had a problem. "Well, okay, we'll let you do it on one ship and try it out." So in 1962 they let me try out on one ship ... [?], there were just the dogs on the four corners. Well, the thing worked like a charm; no problem at all. So the next thing we knew is all of our ships had them, and the next thing we knew the whole industry got rid of all these little fittings around. Well then they said, "Well, you know, the water still isn't getting in the holds, and if it does get in the holds it's gonna get pumped out of the bilges, [and the] containers are hermetically sealed anyways. So what are we carrying these gaskets around on us?" So they let us get rid of the rubber gaskets and we just had like a labyrinth seal now around the edges. So that came along. Then the next thing, people came along and said, "Well, let's leave the hatch covers off." And so, so that's so..it's been evolutionary ...

END TAPE 2, SIDE B.