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The recording begins with someone finishing his presentation. A man's voice says that it's significant to know that "the sleeping giant is no longer sleeping. It's really taking off." They wonder what the next years will bring, and the speaker imagines it being even more fantastic than the previous year. He suggests that they discuss the questions now, and asks the people to introduce themselves. He gives the first turn to speak to "the man on the isle."

[Unclear question.] Another man's voice says that it has been considered and that looking at a map, he would be on a verge [unclear]. [Unclear talking.]

2:43 [Unclear] introduces himself and says that he's a civil engineer from Anchorage and that he has a question. [Unclear.] Another man says that the pipeline could shut down for as long as 2 weeks without serious difficulties with starting again. In the above ground sections that are exposed to winter temperatures, [unclear].

[Disarray sounds.]

4:03 A man's voice asks what if it was 4 weeks. [Unclear. Laughter.] A man raises a question about an unstable spot on the Valdez area of the pipeline, and what would happen in the event of an earthquake or a tidal wave area.

A man's voice answers that as far as tidal waves go, the tank areas are higher than where the tidal waves reach. They are 300 feet above the harbor and sea water. Geological examination of the site that they have located found that it's very stable spot. It's on the south side of the harbor. [Unclear talking.]

The man continues by saying that provided that the line is not restrained in those areas, ductility [?] of the line would be sufficient to withstand earthquakes. There were pipelines built across the Turnagain Arm during 1964 earthquake and the main line never ruptured. Some of the service lines to Anchorage were but the main lines were not.

6:09 Dave is given a chance to speak. [Unclear question.] Another man's voice says that they had the grounded ice islands that they got considerable information from. They now have consultants working on a design for a terminal at Beaufort Sea. Dr. [Unclear] has done some work on it and might be able to give a better answer.

Another man says that the detailed study on ice at Beaufort Sea has been rewarding and the environment seems less severe and hostile than they originally thought. The more they studied it, the more confident they are that building a harbor is not sheer folly. After months of detailed investigation it started to look feasible.

The concepts in harbor design are conceptual at the time. They dream of every possible scheme, put in the numbers, see if it can be built and then price it out. There are easily 10 alternate schemes that have been looked at and now they are down to three. There are three basic concepts that remain under consideration and it is premature to say that they would be feasible. They need a lot more study.

9:11 Another man's voice says that the work they have been doing on the ice islands is that they are out there in about 80 feet of water, which is close to what a large tanker would need. They feel that structures out there would be entirely feasible. The depth is out in the shore of fast ice and if they are going to go further than that, there are going to be other problems.

They have a pretty cold wind blowing and some polar bears, but it seems like they would be able to have structures out there.

Yet another man asks Henderson what the timeline is for building structures and what seasonal obstacles there are. Henderson [?] answers that they hope to finish the construction in April-May of 1972 and that would involve laying half of the pipeline "next year," 1970 and completing the haul road to the North and bringing the pipe by barge to Prudhoe Bay. They would complete the northern half of the pipeline during 1971 and construct 5 pump stations along the route simultaneously and also a terminal to Valdez.

11:14 As far as seasonal constraints are concerned, they feel that they can work through the year except probably in late December and most of January. In some places cold temperatures are going to be an advantage, like in low laying areas.

[Another question from the audience is inaudible.] A man's voice says that there are [unclear] along the line but not necessarily at fixed [unclear] intervals. They are installed in places that are dictated by longitudinal profile of the line. They would be approximately 10 miles apart, but the distance would vary.

The above ground construction would be of the order on 40-50 miles on the northern section and there would be some above ground construction on the southern section but not more than 90 miles out of the entire length.

Leak determination would be done by recording pressures at pump stations and some of the pump stations could be closed remotely and others would be operated on the spot by flying patrols. There would be flying patrols continuously flying up and down the line.

14:01 [Unclear question about the effects of possible Rampart Dam construction.] A man's voice says that the pipeline could easily be diverted to go across a small dam and in case of a big dam, they would probably have to do relocating on the other side of the river, but that could be done without spillage. [Unclear comment. Laughter. More unclear talking.]

The moderator asks for more questions. [Another unclear question.] The previous speaker says that it's maybe more than 100, and says that there would be 50 operators working at the terminal, so "the final concept" would be 150 or something like that. [Unclear question.] The man says it would be a good opportunity.

16:50 [Yet another unclear question about the probability of breakage in the pipeline.] The man says that there have been leakages in pipelines but that Santa Barbara was a totally different thing. Most of the leaks have been due to corrosion in older pipelines, but in modern pipelines there are coatings that are used against corrosion. Another source of leakage is interference from external sources, including accidental use of excavators and deliberate sabotage. The type of steel that is used "on this line," combined with the study that has been put into stable foundations would ensure that they aren't going to get breakages on their line.

[Unclear question.] The man says that the methods have been considered except for in buried or elevated sections. The decision of whether to bury or elevate is

almost exclusively a pipeline decision. They are always most secure underground and in good soils and only when that can't be done will they be elevated. It's a security measure.

19:44 [Another unclear question.] The man answers that the question has been answered in detail and that no amount of insulation will solve the problems in 80% of the line. South of the Brook's Range there's no way to keep permafrost from melting. Bulk of the pipeline is dictated by irrevocable fact and they have any alternatives only from mid-north of Brook's Range.

Another man's voice says that insulation slows the flow of heat but won't stop it.

[Unclear question.] A man's voice says they are going to protect it as long as they can [laughter]. There's a project that is shared by Atlantic Richfield and BP, but they can't make it public yet. They might be able to publish the project when it's completed.

22:08 Dave [Who?] asks how [unclear] with the amount of government assistance that is going to public money, coast guard, university, national science foundation, [unclear talking]. The man says that they are paying for all the information they are getting from the University. The government people have asked to go along with that and they have furnished ice breakers on their own and "we" [an oil company?] didn't ask for their service.

A man's voice from the audience asks if Canadian government will share the information gathered by "this project." The other man says that they will share all the information they gather while they [unclear] but they won't share details on the ship.

A man's voice asks if there are more questions and since there are none, he thanks the speakers.

[Applause.]

[End of the recording.]