

UNITED STATES OF AMERICA

NATIONAL TRANSPORTATION SAFETY BOARD

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Investigation of:

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PACIFIC GAS AND ELECTRIC COMPANY

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SEPTEMBER 9, 2010 ACCIDENT

* Docket No.: DCA-10-MP-008

SAN BRUNO, CALIFORNIA

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Telephonic Interview of: ARTHUR "MIKE" MASSAGLIA

National Transportation Safety Board
 490 L'Enfant Plaza
 Washington, D.C.

Wednesday,
 March 23, 2011

The above-captioned matter convened, pursuant to notice.

BEFORE: RAVI CHHATRE
 Investigator-in-Charge

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I N T E R V I E W

(3:20 p.m.)

MR. CHHATRE: This conversation is being recorded.

MR. MASSAGLIA: Very good.

MR. CHHATRE: Okay. And with me is Dr. Don Kramer. He is a metallurgist. And he is the one who looked at that ruptured pipe. Then I have Matt Nicholson. He's a mechanical engineer.

MR. MASSAGLIA: Yes.

MR. CHHATRE: And he is the one who did all the sketches and looking at the SCADA. Then I have Robert Hall. He's a new addition to NTSB and he'll be looking at integrity management of PG&E.

MR. MASSAGLIA: Okay.

MR. CHHATRE: And I have Carl Gunther. He is the Operations Group chair. So we are five people here today.

MR. MASSAGLIA: Now, what is your title again?

MR. CHHATRE: My name is Ravi, R-a-v-i, and I am investigator-in-charge of this accident.

MR. MASSAGLIA: Right. Okay.

MR. CHHATRE: My last name is Chhatre. I left my name with your son yesterday.

MR. MASSAGLIA: That's right. I got that information.

MR. CHHATRE: Okay. Wonderful.

INTERVIEW OF ARTHUR "MIKE" MASSAGLIA

BY MR. CHHATRE:

1 Q. And so what we're trying to find out is what do you know
2 -- what can you tell us about how the pipe was manufactured. So
3 go back, go 40, 50 years, and tell us.

4 A. Very well. I'll pass on the information to the best of
5 my ability. The first company I went to work for was known as
6 Western Pipe and Steel. It was acquired by Consolidated Western.

7 Q. Can you -- Mike, can you just go a little slow so we can
8 understand a little bit. We are on speakerphone.

9 Okay. So if you -- for the beginning, if you can just
10 go back and tell us your name, some of your educational background
11 for the record?

12 A. Yeah, okay. My name is Arthur "Mike" Massaglia.

13 Q. How do you spell it?

14 A. M-a-s-s-a-g-l-i-a.

15 Q. Okay.

16 A. And I first was employed by -- the original company was
17 known as Western Pipe and Steel. Then it became Consolidated
18 Western Steel. Then it was acquired by American Bridge, a
19 division of U.S. Steel. I worked for that combine from 1946 to
20 1950.

21 Q. Okay.

22 A. First I was hired as a millwright. And then I obtained
23 a degree in mechanical engineering, so then I got into the
24 engineering department.

25 Q. Okay.

1 A. And I can tell you I'm quite knowledgeable of the
2 processes used in the manufacturing of this type that was supplied
3 to the Pacific Gas and Electric Company.

4 Q. Wonderful.

5 A. Now, the first -- and Western Pipe has been a very old
6 company on the West Coast and it specialized in all types of
7 cylindrical pressure vessels, including propane.

8 Q. Okay.

9 A. And they manufactured some huge vessels for propane, up
10 to probably 60 feet long.

11 Q. Okay.

12 A. And these -- and what I might add, all of these vessels
13 had hemispherical ends. They were annealed after all of the
14 welding and other processes were completed, annealed.

15 Q. Okay.

16 A. Then we manufactured penstock for the hydroelectric
17 plants in this area.

18 Q. Okay.

19 A. And then beginning with the use of natural gas, then we
20 got highly involved in building transmission lines for the various
21 utilities.

22 Q. Okay.

23 A. And the beginning process was to make the diameter from
24 a sheet, a flat sheet, into a circular sheet.

25 Q. Okay.

1 A. That process was to make the pipe in a larger diameter,
2 and then we processed it through die that would compress it.

3 Q. Okay.

4 A. The ultimate process was reversed. Instead of the pipe
5 being compressed, it would expand it with hydraulic pressure.

6 Q. Okay.

7 A. And this was -- the greater proportion -- as a matter of
8 fact, I would say all of the type that we built for the PG&E was
9 the expanded process.

10 Q. Okay.

11 A. We -- my job, part of my job under the unions in there
12 is to work out processes of expediting the manufacturing
13 processes.

14 Q. Okay.

15 A. And this pipe, I would say -- now, this -- we're going
16 back 60 years.

17 Q. Right.

18 A. And so my memory of it, it's fair because there's been
19 so much commotion in recent times for this explosion in San
20 Bruno --

21 Q. Right.

22 A. -- that I'm reviving -- I'm revegetating my memory.

23 Q. Okay. Well, that is the reason we are calling you.

24 A. Beg your pardon?

25 Q. That is the reason we are calling you --

1 A. That's right.

2 Q. -- because of San Bruno explosion.

3 A. Now, as I say, I left the company in 1950.

4 Q. Okay.

5 A. So a great deal of that material was still being
6 manufactured by American Bridge, the title name of the company
7 finally when it was acquired by U.S. Steel.

8 Q. Okay.

9 A. I can't tell you how much of this type was built when I
10 was there because I quit at an early time, at 1950.

11 Q. Okay.

12 A. But the records that I have received from your
13 department, the Department of Transportation, indicates that --
14 this is information that I received through a newspaper of your
15 agency.

16 Q. Okay.

17 A. And the information I got from that, that all told, we
18 built about 60 miles of this pipe.

19 Then we -- we received the steel from Kaiser Industries
20 in Fontana and another town that I can't think of. But Kaiser
21 Steel had had a mill in Utah, I think, that -- and that's where
22 the iron ore was available. So they made the pipe out of new
23 material, not out of scrap, new material.

24 Q. Okay. So it was made from --

25 A. And -- did you have a question?

1 Q. Yeah, you said it was made from scrap material or it was
2 made from ore?

3 UNIDENTIFIED SPEAKER: He said new.

4 MR. MASSAGLIA: No, that was made from iron ore.

5 BY MR. CHHATRE:

6 Q. Okay. I want to make sure.

7 A. Not scrap.

8 Q. Okay.

9 A. Okay. Then, let me see now, what else I was going to
10 tell you about it. We tested hydrostatically, to the best of my
11 knowledge, perhaps every tenth pipe that was made. Now, these
12 pipes were made in 30-foot lengths --

13 Q. Okay.

14 A. -- of 30 inches in diameter.

15 Q. Okay.

16 A. We tested those hydrostatically in the machine that was
17 used to expand the pipe. The dies were opened and then the
18 pressure was reduced, to my knowledge, between 400 and 600 pounds,
19 and then they performed what is known as the peen test. Are you
20 familiar with the peen test?

21 Q. Yes, I'm familiar with it.

22 A. All right. I would say that probably 1 in every 100
23 samples that were -- pieces that were made, one of them would
24 burst. From one end of the seem, it would burst the entire length
25 of the pipe.

1 Q. Okay.

2 BY MR. KRAMER:

3 Q. So can I ask a follow-up question on that just to
4 clarify?

5 A. Beg your pardon?

6 Q. My name is Don Kramer and I'm a metallurgist here at
7 NTSB. And I just wanted to ask a question to clarify what you
8 just said. Can I --

9 A. Okay.

10 Q. Okay. You said that 1 in every 10 joint would get
11 hydro-tested?

12 A. No, I would say -- each time when I say the joints, in
13 order to clarify, to make ourselves understood, I stated that 1 in
14 every 50 pipes that were manufactured, one of them would be tested
15 hydrostatically with a peen test. Now, there may have been more
16 than 50; there may have been less. This is one topic I cannot
17 recollect accurately.

18 Q. Okay. But not every piece of pipe was hydro-tested
19 after it was cold expanded?

20 A. No, no. Every piece was expanded --

21 Q. Right.

22 A. -- but I say only about 50 in a batch -- in that batch
23 were tested hydrostatically with a peen test.

24 Q. Okay.

25 A. Now, it may have been 25; it may have been 100. I'm

1 drawing a figure that my mind reflects most accurately. I think
2 there were about 50 pipes.

3 Q. Okay.

4 A. One in 50 would be tested hydrostatically with a peen
5 test.

6 Q. And then you said that approximately 1 out of every 100
7 pieces of pipe that was --

8 A. That's right.

9 Q. -- hydro-tested would fail the hydro test?

10 A. Would burst.

11 Q. Okay. Thank you.

12 A. Another comment. We stretched -- this is, to my
13 interest, is the most crucial. Well, this, this accident occurred
14 -- many alternations were made to the pipe, meaning that pieces
15 were cut and then fitted to the contour of the ground in which it
16 was laid. My knowledge to what we were instructed from higher
17 management that that was never to be done. No peripheral welding
18 was ever to be performed other than where the joints had to be
19 jointed together.

20 Now, what I've read in the local newspapers -- I live --
21 for that matter, I grew up in the area of San Bruno; now I live in
22 Carmel Valley, which is about 100 miles from San Bruno.

23 BY MR. CHHATRE:

24 Q. Okay.

25 A. We strongly stressed that that pipe was not to be

1 modified to conform to the land shape. And when this accident
2 occurred, there were many cuts and weld periphery to conform to
3 the contour of the land, not longitudinally; they were welded
4 peripheries, around the periphery of the pipe.

5 Then another thing that was erroneous, what I've read in
6 publications, all of the pipe that we manufactured was only welded
7 on the outside with complete penetration. If I remember
8 correctly, about 1,000 amps were used and two electrodes were fed
9 simultaneously about 6 inches apart when the two ends were brought
10 together to be welded. And the welding was only on the outside,
11 never on the inside. Hello?

12 Q. Yeah. That is -- we were talking. Now, that will be
13 for the girth welding; would it not?

14 A. Beg your pardon?

15 UNIDENTIFIED SPEAKER: No. No, that's a longitudinal
16 seem.

17 BY MR. CHHATRE:

18 Q. Which weld we are talking about, the 100 amps, two
19 electrodes, 6 inch apart? Are we talking about seem weld or we
20 are talking about girth weld?

21 A. I don't follow what you mean. The seem was --

22 UNIDENTIFIED SPEAKER: There would be no girth weld.

23 MR. MASSAGLIA: -- rolled from a flat sheet into a
24 cylindrical part and then that's where the seem was welded.

25 BY MR. CHHATRE:

1 Q. Okay.

2 A. Now, do I make myself clear?

3 Q. Yeah. So the 100 amp, two electrodes, 6 inches apart,
4 the welding process you are talking about was a longitudinal seem;
5 is that correct?

6 A. Right.

7 Q. Okay.

8 A. It was welded with -- the welding was not done manually;
9 it was done automatically.

10 Q. Okay.

11 BY UNIDENTIFIED SPEAKER:

12 Q. Let me ask you a question. Did you have any kind of QA,
13 QC, or whatever, to make sure you had full penetration? Did you
14 all look on the inside of the pipe or anything?

15 A. The process that was used there, it was called a lock
16 bar that would fit into the -- that would be brought into the pipe
17 on the inside, and this was a piece of copper and it had a radius
18 machined image so that the molten metal would fall into that lock,
19 would come above that lock -- the metal would be molten and it
20 would come -- it would end so that it -- in the inside diameter of
21 the pipes so that it would leave an additional amount of material
22 that doubled the thickness of the wall of the pipe. This copper
23 bar was water-cooled and the weld penetrated both ends of the
24 plate where it was beveled on the outside where the welding was
25 done on the outside of the pipe. Do you follow me?

1 Q. Yeah.

2 A. Okay. That was the method of -- the intention was to
3 have a complete penetration. And this copper bar that was held in
4 place with a die would allow for the weld to be a complete weld.
5 And it was only welded on one side. It was never welded on the
6 inside, only on the outside.

7 Q. Okay.

8 A. And the electrodes that were used, there were two of
9 them. I believe one of them was probably 3/16th in diameter and
10 then the other electrode that followed by about 6 inches behind
11 the first one was 1/8. And a powdered flux was used -- these rods
12 were not coated. They were bare rods. And a powdered flux would
13 be injected so that the arc was a submerged arc. And that was the
14 process of welding those pipe, of welding the longitudinal seem.

15 Q. So it was a single submerged arc weld?

16 A. Well, there were two --

17 Q. Or double submerged arc weld?

18 A. There were two electrodes: one of the larger diameter,
19 which I think was 3/16th; one that followed about 6 inches behind
20 and was 1/8th.

21 Q. Um-hum. Okay.

22 BY MR. CHHATRE:

23 Q. And what is the purpose of having two electrodes?

24 A. How was that again?

25 Q. What was the reason for having two electrodes?

1 A. I suppose to make a more complete weld seem. And the
2 diameter of the pipe -- this pipe, as I recall, was made in 7/16th
3 thickness, 3/8th, and 5/16th. And that's the reason we used not
4 one, but two electrodes in the process of welding the seem.

5 Q. Okay. Now, was this the process that was used to supply
6 all PG&E pipe or was it -- there was any other process that was
7 used?

8 A. How is that again?

9 Q. Was this the only process that was used to make the pipe
10 that was supplied to PG&E?

11 A. That's right. That was the only -- the process that --
12 that process was the process used on all of the pipes that were
13 manufactured by American Bridge.

14 Q. Okay.

15 A. Who built special equipment to manufacture this pipe.
16 American Bridge built special equipment of their own design to
17 manufacture this pipe.

18 Q. Now, do you recall any double submerged arc process --

19 A. What?

20 Q. -- being used for seems? Was it a double submerged arc,
21 DSAW?

22 A. Right. It was a submerged arc. It was a submerged arc.
23 The wire was not coated. It was bare wire and they used a
24 granulated flux --

25 Q. Okay.

1 A. -- that the arc was submerged in.

2 Q. And where was the plant located that made this pipe?

3 A. Okay. One was in South San Francisco -- not San
4 Francisco, South San Francisco.

5 Q. Right.

6 A. And then the other part was located in Maywood, both in
7 the state of California.

8 Q. You said --

9 A. Maywood is in the southern part of the state. San
10 Francisco you, of course, would know where San Francisco is.

11 Q. The other one, Haywood, H as in Hattie, right?

12 MR. KRAMER: No, Maywood.

13 MR. CHHATRE: Is it Maywood?

14 MR. KRAMER: It's in Los Angeles.

15 MR. CHHATRE: Okay.

16 MR. MASSAGLIA: Yeah, that's the Los Angeles area.

17 MR. CHHATRE: Okay. All right.

18 BY MR. CHHATRE:

19 Q. And where were you located?

20 A. Beg your pardon?

21 Q. Where were you working?

22 A. I was working in the South San Francisco plant.

23 Q. Okay. Now, could there be another welding process at
24 Maywood?

25 A. Who did the what?

1 Q. Was the process of preparing pipe in Maywood be
2 different than what --

3 A. No, the processes were identical. Maywood was a bigger
4 plant than the South San Francisco plant.

5 Q. Okay.

6 A. And all of the modifications to the equipment to
7 manufacture this, this all was done at the Maywood plant.

8 Q. Okay.

9 A. And then they shipped the equipment up to South San
10 Francisco to manufacture the pipe.

11 MR. CHHATRE: Any questions?

12 BY UNIDENTIFIED SPEAKER:

13 Q. Do you remember whether the pipe was made to API 5L
14 specifications?

15 A. I believe it was.

16 Q. Do you remember what type of X it was, like 42, 52, or
17 what kind you all made?

18 A. Now --

19 Q. I mean, if you don't remember, there's nothing wrong
20 with that. It's been 60 years.

21 A. No, I think maybe I shouldn't agree to that comment. I
22 don't have any knowledge of what the SAE specs were.

23 Q. Fair enough.

24 BY MR. KRAMER:

25 Q. Yeah, I was wondering what -- do you recall what range

1 of diameter pipe they were making at the facility?

2 A. Thirty inches.

3 Q. Just 30-inch?

4 A. Just 30-inch for that particular -- for the PG&E.

5 BY MR. CHHATRE:

6 Q. Did you make any other diameter pipelines in South San
7 Francisco?

8 A. What was that about the pipeline?

9 Q. Did you make any other diameter pipelines?

10 A. Oh, yes. We made many diameters of pipe, but some of
11 them were for transmission of water. We made pipes up to 6 feet
12 in diameter for water transmission.

13 Q. Okay.

14 A. This gas pipeline was something new at the time.

15 BY MR. NICHOLSON:

16 Q. And what -- this is Matt. What wall thicknesses did you
17 say you manufactured in the 30-inch?

18 A. How was that again?

19 Q. Yeah, I was curious. Could you tell us again what wall
20 thicknesses were manufactured at your facility?

21 A. I didn't get the first part of your question.

22 Q. Yeah. Could you tell us what wall thicknesses?

23 A. Oh. Well, yeah, we made wall thickness for penstock up
24 to 2 inches in thickness. This was a hydroelectric --

25 Q. No, I'm more curious about the PG&E pipe, the 30-inch

1 pipe. Can you go back --

2 A. Well, that pipe was, as I say, 5/16th, 3/8th, and
3 7/16th.

4 Q. Okay.

5 UNIDENTIFIED SPEAKER: That's what I got.

6 BY MR. KRAMER:

7 Q. And -- this is Don Kramer, the metallurgist again.

8 A. Yes.

9 Q. What about the length of pipe that you made? What
10 length of pipe did you make?

11 A. This was all -- for the PG&E job was all 30 feet.

12 Q. Okay. And you never made anything longer or shorter
13 than that?

14 A. Not to my knowledge. I think these sheets were rolled
15 to that specification particularly for that pipe. This was
16 specially processed sheets for the purpose of manufacturing this
17 pipe.

18 Q. Right.

19 A. I believe that -- I don't know whether any division of
20 U.S. Steel made any of the pipe. I think that all of this pipe,
21 to my knowledge, was made by Henry Kaiser in his plant in Fontana.

22 Q. Okay. And what do you recall about how the steel plates
23 were prepared for welding?

24 A. In order to -- well, to transfer the welding, the edges
25 of each plate were broke in a separate process and then they were

1 rolled into a round on a pyramid type roll.

2 Q. And I'm not very familiar with -- is the diameter of
3 that -- how -- is the diameter of that set or is that adjustable,
4 the pyramid roller?

5 A. The diameter of what?

6 Q. Of the pyramid roller. Is that rolled to a set diameter
7 or can you change the setting on that?

8 A. Well --

9 Q. You got to roll a 36-inch pipe, you could change it
10 or --

11 A. Oh, yeah. On the pyramid roll you could roll any size
12 diameter you need to roll.

13 Q. Yeah. Right. And so did you -- on the plate, did you
14 put a -- were there like a bevel or what kind of edge treatment
15 was given on the plate; do you recall?

16 A. Yes. Before the rolling, each plate was beveled,
17 each -- longitudinally. That was done on a machine -- on a metal-
18 cutting machine, planer-type machine.

19 Q. Okay.

20 A. If you understand what a planer is.

21 Q. Yeah.

22 A. And now in a planer the work moves, and on this process
23 the work was stationary and the cutting tool moved.

24 Q. Okay. Do you recall the specification for the bevel?

25 A. To my knowledge, I would say that both plates were

1 beveled at about 30 degrees.

2 Q. Okay.

3 UNIDENTIFIED SPEAKER: Just one side.

4 UNIDENTIFIED SPEAKER: Yeah, so you end up with 60, and
5 that's right.

6 BY MR. KRAMER:

7 Q. And is this -- the beveling that you did was only one
8 side; is that correct?

9 A. What was that again?

10 Q. The beveling, was that only performed on one side?

11 A. It was performed on both pieces -- on both parts that
12 came together only on the top.

13 Q. Only on the top, okay.

14 UNIDENTIFIED SPEAKER: That's how we do it today.

15 BY MR. KRAMER:

16 Q. And I didn't hear before, did you mention there was --
17 were these welds radiographed or x-rayed?

18 A. No, none of them were radiographed, none of them were
19 x-rayed. They would cut out -- every so many pipes, they would
20 cut out a section and then send it to the metallurgy department
21 and they would perform both a tensile and a bend test on these
22 specimens.

23 Q. Okay.

24 A. About -- and that was done again on about every, to my
25 -- again, to my knowledge, probably between 20 and 50 pieces in

1 manufacturing. These specimens were cut out and then they would
2 be sent to the metallurgy department for both tensile and bending
3 tests.

4 Q. Okay. Did you ever have a chance to go to the Maywood
5 facility?

6 A. Never did.

7 Q. Did you know anyone that worked at the Maywood facility?

8 A. No, I didn't know anybody there.

9 Q. Okay.

10 BY UNIDENTIFIED SPEAKER:

11 Q. Now, you mentioned that occasionally, you said like 1 in
12 100 would fail the hydro and burst.

13 A. Right.

14 Q. What was done with that material after that failed test?

15 A. The material was cut up and sold for scrap.

16 Q. And you indicated that when it burst it would split from
17 one end to the other?

18 A. Absolutely.

19 Q. So the failures always tended to be from the end and not
20 a fish mouth?

21 A. That's right. It would begin from each end and come
22 towards the center. Those pipes were never salvaged. They were
23 always cut up for scrap.

24 BY UNIDENTIFIED SPEAKER:

25 Q. So are you familiar with the term joiner?

1 A. Well, be a little bit more explicit and maybe I'll --

2 Q. Well, we've heard in the specifications that there are
3 pieces of pipe called joiners, usually 5 foot but not less, that
4 can be girth-welded or welded together to make up a standard
5 length of pipe.

6 A. Right. That's what I -- that's what I feel very
7 critical about that PG&E did this. We never did any of that kind
8 of --

9 UNIDENTIFIED SPEAKER: He said that.

10 MR. MASSAGLIA: We never did any peripheral welding at
11 all on that pipe. We strongly recommended not to be done.

12 BY MR. CHHATRE:

13 Q. Now, is that documented someplace or you just told that
14 verbally to PG&E?

15 A. Just verbally. I never knew -- well, yes, I did know at
16 the time that this pipe was manufactured for the PG&E, but I
17 never -- I don't remember of PG&E having any inspectors. There
18 were several inspectors that would come into our plant, but I
19 don't recall there ever being any PG&E inspectors inspecting their
20 work.

21 Q. Okay. And what is the reason for not wanting to have
22 girth welds on this pipe?

23 A. What was that?

24 Q. Why you would not recommend welding pieces together on
25 this pipe?

1 A. Because when you do a great deal of processing on any
2 metal piece, you set up stresses.

3 Q. Okay.

4 A. And like I say, the company I was with manufactures a
5 lot of crucial high pressured vessels. And being the fact that
6 this pipe was never annealed -- we were asked to make some studies
7 of what the feasibility was in annealing the pipe after it was
8 completely manufactured, but the cost was prohibitive.

9 Q. Okay.

10 A. Now, like I say, we -- this division of U.S. Steel
11 specialized in manufacturing of any object that was out of the
12 usual.

13 MR. KRAMER: Did you guys -- do you know if you had any
14 stamps or markings in particular, any way you identified --

15 MS. MASSAGLIA: Yeah, all of this -- each joint was
16 stenciled.

17 BY MR. CHHATRE:

18 Q. Inside or outside?

19 A. Outside.

20 Q. Nothing on the inside?

21 A. Not in the inside. Not to my knowledge.

22 Q. Okay. And what kind of stencil mark was that? What
23 would it say on the stencil mark?

24 A. It would have, to my knowledge, a code system to
25 identify one part from the other. I think that was the main

1 purpose of doing marking on the pipes.

2 Q. Like some kind of a numbering system or how would --

3 A. A number that was similar to a Roman numeral.

4 Q. Roman numerals, okay.

5 A. Yeah. And why that was that, I have no idea.

6 Q. Okay.

7 BY UNIDENTIFIED SPEAKER:

8 Q. Do you know if on any occasion welds were repaired, that
9 were not satisfactory, in the shop?

10 A. To my knowledge, anything -- any imperfection was
11 destroyed, the part -- the piece was cut up for scrap.

12 Q. So there was never any manual welding performed on any
13 of the pipe lengths?

14 A. There was manual welding on the ends, because this was a
15 continuous process and then when one length of pipe was completed,
16 it had to be -- both ends would have to be finished by hand.

17 Q. The finishing of the pipe by hand, were there -- did the
18 welders apply any stamps to signify who did that?

19 A. Not to my knowledge.

20 BY MR. CHHATRE:

21 Q. And how much length we are talking about on each end
22 that they did manual welding?

23 A. That was done manually.

24 Q. Yeah, how many inches from each end?

25 A. How what? How many inches?

1 Q. Uh-huh.

2 A. Oh, I would say perhaps -- probably not more than 6
3 inches at the most. It all depended -- the machine had to be
4 turned off at the end of each pipe and then it had to be restarted
5 with the next pipe that came through the assembly system.

6 Q. Now, when you say each pipe, are you talking about 30
7 feet long or you are talking about hundreds of feet long?

8 A. No, these are only 30 feet long.

9 Q. Okay. So on each 30 feet, the two ends each will be 6
10 -- 6 inches from each end were manually welded from outside only?

11 A. Okay. Between 2 and 6 inches, depending on how the
12 operator would turn the machine off when that pipe was completed.

13 Q. Okay.

14 A. And then that was finished by hand.

15 Q. Okay. And were those welds ground on the top on the
16 outside?

17 A. Yes. What had to be finished manually was ground
18 finished.

19 Q. And why is that?

20 A. Beg your pardon?

21 Q. Why would you do that?

22 A. They do that to make it uniform so that when they were
23 -- when they were welded on a (indiscernible) hitch in the field
24 they had to make that end -- make both of those end seems as
25 perfect as possible. That's why the expansion was crucial. We

1 used to have considerable trouble in maintaining the same
2 diameters for the sole purpose so that would make possible a more
3 uniform weld when they were --

4 UNIDENTIFIED SPEAKER: Do you recall what welding --

5 MR. MASSAGLIA: -- (indiscernible) weld in the field.

6 UNIDENTIFIED SPEAKER: Do you recall what welding
7 process they used for this manual weld at the ends?

8 MR. MASSAGLIA: Well, it was the method used on any hand
9 welding.

10 UNIDENTIFIED SPEAKER: Stick welding, then?

11 MR. MASSAGLIA: These welders that did the finishing
12 were all certified.

13 MR. CHHATRE: Okay.

14 MR. MASSAGLIA: All the welders that finished the end of
15 the pipe seems were certified welders.

16 BY UNIDENTIFIED SPEAKER:

17 Q. And so I just want to go back. The only time -- the
18 only part of the weld that was ground down was the manual weld?

19 A. Right.

20 Q. There was never a time when you would have ground down
21 the entire long seam on a joint?

22 A. Never.

23 Q. Okay.

24 A. If that was -- if that had any imperfections it was
25 scrapped.

1 BY MR. CHHATRE:

2 Q. Were those ends ground off from inside?

3 A. Both sides, outside and inside.

4 Q. Okay.

5 A. That is, just on the ends of the pipe.

6 Q. Right.

7 MR. KRAMER: So you were grinding on the outside and on
8 the inside of the pipe?

9 MR. MASSAGLIA: Right. Yeah.

10 UNIDENTIFIED SPEAKER: So when you do a girth weld,
11 it'll work.

12 MR. KRAMER: Um-hum.

13 MR. MASSAGLIA: Sure. Because when you're doing that
14 manually, you're going to get an imperfection on the inside of the
15 pipe too.

16 BY MR. CHHATRE:

17 Q. And how would you check if the weld has penetrated all
18 the way through the wall?

19 A. Say that again.

20 Q. What kind of inspection you did on the seem to make sure
21 there is no incomplete welding?

22 A. Well, that can be detected visually very simply. When
23 the automatic process ceased or when it begun it was somewhat
24 difficult to keep that uniform. That's the reason for finishing
25 both ends by hand.

1 Q. Okay.

2 A. And -- by hand arc welding.

3 Q. So were the ends welded before the pipe was expanded or
4 how did that work?

5 A. No, the welding was done after the pipe was expanded.

6 Q. Can you repeat that? That doesn't make any sense.

7 A. Beg your pardon?

8 Q. Can you repeat what you said? You said the pipe will be
9 welded most of the length and then it will be expanded without
10 ends being welded?

11 A. No, no, I maybe confused myself --

12 Q. That's okay.

13 A. -- with the question you asked, whether it was the --
14 whether the testing -- I would think that all of the processing
15 was completed before the pipe was tested.

16 Q. Okay. And what will be the diameter of the pipe before
17 you expanded it?

18 A. Well, the pipe was just enough under the diameter in
19 order to have some material left to properly expand it.

20 Q. Okay.

21 A. I would say maybe a very minute fraction. Maybe the
22 pipe may have been a quarter of an inch smaller in diameter before
23 the expansion.

24 Q. Okay. And how would you go about doing that? Was it
25 gas expansion? How you expanded that?

1 A. That was hydraulic.

2 Q. Hydraulic. And what was the pressure; do you remember?

3 A. It was water, water with soluble oil.

4 Q. Okay. And do you remember what was the pressure used to
5 expand it?

6 A. Well, I -- in this process we had a hydraulic-type
7 piston pump.

8 Q. Right.

9 A. That would develop a pressure of, if my mind serves me
10 right, of about 5,000 pounds.

11 Q. Okay.

12 A. And then when that was done, the pressure was further
13 raised by what is known as a tubulation process.

14 Q. What process?

15 A. (indiscernible) again. I think that -- I don't remember
16 exactly. I think they used in the order of probably 10- to 20,000
17 psi in expansion of that pipe.

18 Q. Okay. And how long it will take to do that?

19 A. Oh, I would say the complete process of welding and
20 testing for each length of pipe was probably 20 minutes. No,
21 probably more than that.

22 Q. Okay.

23 A. But that was done quite rapidly.

24 Q. Now, do you recall if any of these pipes kind of
25 ruptured during the expansion?

1 A. No, they couldn't rupture because there was a die. See,
2 they were expanded against a die.

3 Q. Okay.

4 A. They only -- they burst when they were tested
5 hydrostatically when the die was open.

6 Q. Okay. And why would it burst the pipe? What is the
7 reason?

8 A. I'm not a metallurgist; I can't answer that.

9 Q. Okay.

10 A. I can't give you -- I think the projectile that was used
11 in the peen test was a bar of cylindrical iron, steel, that may
12 have been between 2 and 3 inches in diameter, about 8 feet long.
13 And when that pipe was brought up to the test specifications, this
14 device was dropped. And the impact of that fall would in some --
15 there were cases when it would cause the pipes to burst from one
16 end to the other under a pressure of what was called for the test
17 to be conducted.

18 Q. Okay. Well, have you heard of the DSAW process, double
19 submerged arc welding process?

20 A. No. Now, what was that process again?

21 BY MR. KRAMER:

22 Q. Well, you know the process that you described for the
23 outer diameter surface of the pipe?

24 A. Yes.

25 Q. Do you recall if that was ever used on the inner

1 diameter surface of the pipe or were the pipes that you made only
2 ever welded along the outer diameter surface?

3 A. Only welded on the outer diameter surface. There's no
4 other way I can see of any other process being used other than the
5 process I've explained.

6 Q. Okay.

7 A. Or maybe I don't understand completely. You have to
8 repeat your comment and maybe I can --

9 MR. CHHATRE: Okay. Well, sometimes what happens is
10 you'll be welding --

11 UNIDENTIFIED SPEAKER: Let's not put words in his mouth.

12 MR. CHHATRE: Okay. All right.

13 BY MR. CHHATRE:

14 Q. And what year you left American Bridge? Was it 1950 or
15 1950, you do not remember the date?

16 A. No, I don't remember the exact date. You mean the time
17 I terminated employment?

18 Q. Uh-huh.

19 A. You asked me my reason or --

20 Q. No, no, no, no. Your year, what year. 1950?

21 A. Yeah. Definitely 1950.

22 Q. Okay.

23 BY UNIDENTIFIED SPEAKER:

24 Q. Do you remember during what years you were making pipe
25 for PG&E?

1 A. We began that job in probably 1947 and that job
2 continued quite some time after I left the company.

3 Q. Okay.

4 A. And if this is of any use, I understand that Kaiser
5 underbid Quest Steel (ph.) and they got the job for the next batch
6 that was manufactured.

7 Q. Can you repeat that again, please?

8 A. Beg your pardon?

9 Q. Can you repeat that?

10 A. When our contract terminated and a new contract was
11 called for, U.S. Steel lost that contract to Kaiser Steel.

12 Q. Okay.

13 A. And then I also was told that when the contract came up
14 for another order, Japanese concerns underbid Kaiser.

15 Q. Okay. Do you know if 30-inch pipe for PG&E continued
16 after 1950 how long? Do you have any knowledge of that?

17 A. Repeat that.

18 Q. How long after 1950 the pipe for PG&E was still being
19 made at your facility?

20 A. Well, I received reports that I have from the federal
21 government, Department of Transportation and Safety, that that job
22 carried on into the mid-50s.

23 Q. Okay. But you do not know that?

24 A. No.

25 Q. Do you know anybody who worked through 1950s after you

1 left?

2 A. No, I don't. All of those people are deceased.

3 Q. Okay.

4 A. I'm 88 years old. I wonder how I happen to be a fortune
5 one to still be around.

6 Q. Now, do you have any other information that you think we
7 should know about that pipe that we have not asked you?

8 A. Well, maybe I could reiterate that I think it was a
9 very, very poor practice for that particular case where that pipe
10 burst to have refabricated a pipe with so many contours.

11 Q. Let me ask you another question. During that period and
12 you were at the South San Francisco facility, would there be any
13 other outfits in there that could make small sections of pipe?

14 A. Not really. That diameter pipe was a new process, was
15 something that was just completely developed.

16 Q. No, no, what I'm asking is can somebody take a small
17 piece of 8-foot long plate and make that small diameter or small
18 length pipe?

19 A. Oh, sure. A lot fabricating shops could do that.

20 Q. And were they available -- those shops existed in that
21 era, in 1950s?

22 A. I have difficulty understanding you. Can you repeat
23 that?

24 Q. Were there outfits available in Bay area who made that,
25 small sections of pipe from the plate?

1 A. Yeah, I think so. South San Francisco is a very
2 industrial area. I think there would have been a lot of other
3 smaller concerns that could do that.

4 Q. Okay. How would they do that? I mean, you had a big
5 facility at American Bridge, but how would a small outfit make
6 that?

7 A. Well, that kind of product is not difficult to
8 manufacture.

9 Q. Tell me more.

10 A. Beg your pardon?

11 Q. Can you tell me more?

12 A. I can't understand what you're saying.

13 Q. How would a person make that kind of small sections?

14 A. Well, a small -- if it was just one piece you needed, a
15 lot of steel fabricators have the capability of doing such -- of
16 performing such tasks.

17 Q. All right.

18 A. I can't tell you what procedures they would use.

19 Q. Okay. If you're not familiar that is fine.

20 A. Beg your pardon?

21 Q. No, that is fine.

22 A. Okay.

23 MR. CHHATRE: Any other questions?

24 UNIDENTIFIED SPEAKER: No.

25 BY MR. KRAMER:

1 Q. I just -- I have just one more question. I know we
2 asked you some rather technical questions about API specifications
3 and all of that, but do you remember anything about the grade of
4 steel that was coming from Kaiser, anything at all about the
5 mechanical properties or the chemical properties of it? Anything
6 that would have stuck out for you?

7 A. Well, I wasn't directly involved in that but I would
8 assume, not guess, I would assume that that was made to very
9 strict specifications --

10 Q. Yeah. Okay.

11 A. -- under government regulations that -- for the PG&E.

12 Q. All right. Thank you.

13 A. Yes.

14 BY MR. CHHATRE:

15 Q. Okay. Well, we have no questions for you. We
16 appreciate your time and should we have any more questions, we may
17 call you again, call on you again. But do you have any questions
18 for us?

19 A. No. I think I'm pretty well informed about everything
20 that we talked about.

21 Q. Okay. Great.

22 Now, for the record, can you tell me your educational
23 background?

24 A. Beg your pardon.

25 Q. Can you tell me what degrees do you have and from where

1 for the record?

2 A. Can you --

3 Q. Can you tell me which college did you go to get your --

4 A. Okay. I first, before World War II, I attended the
5 University of California at Berkley. During the war I worked for
6 the Navy Department at Pearl Harbor.

7 Q. Okay.

8 A. And as the war began to wind down, I had a lot of time
9 on my hands, so to find something to do at this time I did attend
10 various classes at the University of Hawaii.

11 Q. Okay.

12 A. My final education was with Stanford University.

13 Q. And what degrees did you get?

14 A. I got a degree in mechanical engineering.

15 Q. Bachelor's? Master's?

16 A. Bachelor's.

17 Q. Okay. Great. Hey, thank you so much for your time. We
18 appreciate your help in this investigation.

19 A. My pleasure. Any more questions?

20 Q. No, no, no. You've been more than helpful. Thanks
21 again.

22 A. Very good.

23 Q. Bye-bye.

24 A. Thank you. Bye.

25 (Whereupon, the interview was concluded.)

CERTIFICATE

This is to certify that the attached proceeding before the

NATIONAL TRANSPORTATION SAFETY BOARD

IN THE MATTER OF: PACIFIC GAS AND ELECTRIC COMPANY
 SEPTEMBER 9, 2010 ACCIDENT
 SAN BRUNO, CALIFORNIA
 Interview of Arthur "Mike" Massaglia

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DATE: March 23, 2011

was held according to the record, and that this is the original,
complete, true and accurate transcript which has been compared to
the recording accomplished at the hearing.

Kay Maurer
Transcriber