ORIENTATION ON MOBILIZATION PROBLEM

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INDUSTRIAL COLLEGE OF THE ARMED FORCES

Washington, D. C.

ORIENTATION ON MOBILIZATION PROBLEM

12 November 1954

COLONEL BARTLETT: Admiral Hague, General Niblo, Gentlemen: This talk is unclassified and it is going to be reproduced, so you need not take any notes; I hope you have all read the final problem, which was issued to you on Monday. Unit IX does not start until next May, and we do not expect you to do any research, any study, any specific reading, and certainly not any writing on this problem before 8:30 a.m., the third of May. However, we feel that by giving you the problem now that between now and May you will be better able to correlate the work in the other units and take advantage of them for the final problem.

That is why we are having the orientation lecture in the final problem so early this year. This was borne out by the recommendations of previous classes--first, that we make the problem more realistic and closer to current Soviet capabilities, and secondly, that we hand out the problem earlier.

I believe we have accomplished both of these objectives. It has certainly come early in the year and, after I finish today, if you have any questions concerning the realism or the validity of the assumptions, we will welcome those questions. This final problem is going to be a summarization of everything you learn here during the entire year. Each Branch Chief and most of the members of each Branch have given me many useful suggestions, phraseology, and rephrasing, and they have been used in writing the problem. Consequently, it is truly a problem prepared by the faculty as a whole, and we have high hopes that you will find it very interesting and that you will have an opportunity to develop a report which will be a substantial contribution to studies on national security.

Now, before I comment on the details of the problem, let us review the mission of the College and the mission of the final unit. Here, in brief, is the mission of the College, and I have underlined the key words:

"1. To prepare for <u>important</u> assignment.

2. To study <u>all phases</u> of our national economy and interrelate the economic factors with <u>political</u>, <u>military</u>, and <u>psychological</u> factors.

3. To study peacetime and . . . wartime governmental organizations and the most effective wartime controls."

Below it is the mission of the Mobilization Branch in the final problem:

"To study the problems and methods of economic mobilization and reconversion . . . including their relationship to world affairs and free world security."

Now, let's review the problem and clarify some of the ideas and questions which may be in your minds. I will not discuss the purpose and the scope of the problem, but you may ask questions about them later if you wish. I presume you have noticed that there are really two problems this year, and the class will be divided into two groups.

You are undoubtedly aware by now that there are two distinct fields of thought with respect to the duration of any war in this thermonuclear age. General Thomas D. White, Air Force Vice Chief of Staff, said in Miami on 20 October in a public speech, and I quote:

"The formidable modern weapons probably will make any future war as short in time as it will be terrible in destruction. The outcome of such a war will be decided with the forces ready to go at its outset."

On the other hand, you will recall that we had a War College lecture last month in which General Orville Anderson, also Air Force, advanced as a postulate that, in comparison with the alternative of complete slavery under Russian domination, no blow against the United States, no matter how severe, could be fatal. Therefore, for this and other valid reasons, you could well argue that, no matter how severe the initial blow of the Soviet might be, the war would follow its historical pattern of recovery, conversion to full mobilization, and buildup of our forces for a land invasion.

In solving the first three requirements, Group A, half of the class, will assume that the all-out war will last several years, with perhaps the historical pattern of mobilization and buildup phases, followed by an offensive phase. Group B, on the other hand, will assume that the war may be over quickly, perhaps in ninety days, more or less, and that at the end of this short period the war will end. You can assume that either we will defeat the enemy within this time or that both sides will have suffered such damage that no further major combat is possible.

However, for the fourth requirement, each group will evaluate the applicability of its proposed economic mobilization program against the alternate condition.

We will have four committees in each group, with 17 members in a committee. Now, this is rather a large number, but it does give you the advantage of having more manpower and consequently more man-hours to put upon parts of the problem. The committee chairman will have to be a good organizer in order to manage a group of this size. There are enough individuals, however, so that he can have several assistants, as well as a spokesman and an editor.

Let's turn now to discussing the basic assumptions listed in paragraph three of the problem.

ASSUMPTIONS

A 1. The very real probabilities, for the next generation, that:

a. We shall continue in a long period of cold war.

b. We shall become involved in limited peripheral war.

c. We shall become involved in an all-out war with, or without, allies.

B 1. Damage and Casualities (Secret).

2. No preventative war by U. S.

3. USSR principal target is SAC.

4. USSR secondary target is personnel.

GROUP A	GROUP B
5. Long War	Short War

Notice the words, "The very real probabilities, for the next generation." Now this is the basic concept and, if you accept this concept without reservation, then it must influence strongly all your conclusions and your decisions, and the recommendations in your report. Please notice

that the problem does not say that each of these probabilities has the same degree of probability. If you wish to discuss that subject, or think it necessary to do so, you are welcome to put a discussion of that in your report, too. But if your committee cannot accept unreservedly that these three conditions are probable and significant, then we will give you an opportunity to justify an alternate basic concept to us and secure faculty approval. This is necessary because the school policy for this problem is that we prefer all students to have the same basic assumptions--in other words, start from the same springboard.

All of the basic assumptions here are subject to this same policy. If, after committee discussion, you cannot accept them unreservedly, then you may propose alternate basic assumptions and secure approval to substitute them, before you do any research. I do not think this is going to force you down a directed path to a uniform type of solution. Neither will it restrain you in stating additional detailed assumptions which you may wish to list in order to clarify the range of the research that you are going to do, or clarify this basic concept. In fact, I would be very surprised if any two committees reached almost identical conclusions as to the best solution for this complex problem of economic mobilization under today's conditions and the trends in these conditions which affect economic mobilization.

I anticipate that your concept of realism may cause you to fight the problem most seriously with respect to assumption 3b(1), the hypothetical attack upon the United States, and the direct damage to industry and the deaths and injuries from this hypothetical attack. Now, this information will be given to you next May in an appendix which will be classified Secret. I cannot give you the details of this appendix now, but I can explain the procedure, or the formula, that we used to derive the statement of damages and casualties which will be given to you. First, we accepted the premise that a security classification of Secret would be adequate for our objectives. Incidentally, even though annex "A" is Secret, that does not mean that your report must be Secret. On the other hand, we urge you not to submit any Top Secret reports.

Secondly, we took these assumptions to JCS and we asked them, "Do they all appear logical and realistic?" In other words, without asking them to rephrase the assumptions based upon their own latest strategic and intelligence appreciations, or in relation to the actual current war plans, which, of course, are Top Secret as well as on a need-to-know basis, we asked them if they would agree that all the assumptions stated in the problem were acceptable. We were flattered

to have them agree that even without access to their information we are at least in the same ball park with them. I mention this in case you wish to radically change any of the basic assumptions given to you.

Third, we devised a formula for the hypothetical attack. I went to the Air University and to the Weapons Development Section of the Air Command and Staff School. With their help, we set up an attack which we feel is realistic. We assumed the total weight of bombs in the Soviet stockpile and we assumed the percentage to be expended in this first attack. The assumption used was that the USSR total stockpile in June of 1955 would consist of:

No.	Yield	Radius (Miles)	Area (sq. mi.)	Total Area (sq. mi.)
200	50KT	1.7	9.06	1812
50	1MT	3.9	48.15	2430
				4242

Now, we assumed that the Soviets would keep in reserve against future needs 15 percent of this stockpile, and that, for the purpose of neutralizing the Strategic Air Command and for use against continental European targets, they would use 45 percent. Consequently, there would be available for attack on U. S. cities 40 percent. The 45 percent used against SAC and continental targets is not included in appendix "A" because the industrial damage from this attack is negligible and because the casualties are so small as to be included within the error in accuracy of the personnel computations.

This 40 percent to be used on U. S. cities gives us 80 50 KT bombs and 20 1-MT bombs to be launched against cities. Next, we arranged the metropolitan areas in the United States in the order of their population. Starting with the top target, we assigned sufficient kilotons or megatons to cause "adequate major damage" to that area. After we had used up nearly all the megatons and kilotons, we arbitrarily added the Sault Ste. Marie locks--that is the last one on the list. Next we rolled the dice to secure interceptions and Red weapons shot down. If the die came up one, two, three, or four, the target was hit; if the die came up five or six, it was a miss. Actually we rolled 70 hits out of 100 bombs, which is a little bit above the mathematical two-thirds probability. We did not assume that all weapons would be carried by airplanes.

We finally had a list of 70 weapons which landed on 50 targets. Now, by the roll of the dice, certain cities escaped--Baltimore, Seattle, Allentown, Bethlehem, Toledo, Omaha, Syracuse, Phoenix, Oklahoma City, and Charlestown, West Virginia all escaped. However, other cities received one, two, or even three hits. Six of the one-megaton bombs are going to be surface bursts, to secure fall-out patterns at major transportation centers. These will be plotted for you so that you can vizualize the disruption which will ensue. Now, as you can imagine, there was a good deal of argument, but I don't see how we could have a better solution unless we used Top Secret information.

This list has been given to FCDA and to the Air Force UNIVAC operator. FCDA will help us to compute personnel losses for both daytime and nighttime attack, and UNIVAC will give us the industrial damage. I won't go into the details of either of these methods. You will have either lectures or seminars on the subject next May. So now we have appendix "A"--the damage and the casualties from an attack which we feel is realistic. It is classified Secret and you will not need it until next May.

One bonus of this problem will be that, if you can grasp the magnitude of the damage to the United States from such an attack, you will have a better appreciation of what a United States attack, with our stockpile, might do to the USSR.

By giving you the problem this early, you may be able to reduce the amount of time you spend in organizing your committees next May and get rolling on the problem. We hope so. At the same time, we urge you to be extremely critical in stating so-called facts. In the Orientation lecture for Unit I last August, I said: "You should train yourself to completely reject any passive acceptance of the thoughts of others, as a major objective in your intellectual development." Often these thoughts may be implied, rather than openly expressed.

As a specific example, the UNIVAC will state industrial damage in several terms. One of these is "dollars added in manufacture." Now I ask you to consider whether this is a true yardstick for the measurement of the damage to our industrial potential, which would be caused by the obliteration of factories. If you conclude that it is not, I suggest that you ask whether, even so, it is still the best yardstick we can devise, or at least a useful yardstick for a partial measurement of damage.

I wish you could have heard Mr. Frank Pace, the former Secretary of the Army, talk to the ICAF alumni on November 4. His words were not recorded but his thesis was that our primary responsibility today is to prevent an all-out war, and that to fight it is our secondary responsibility. Consequently, our potential to fight is as important as our immediate capacity to fight. Preparedness in peacetime is, for the indefinite future, a constant factor of our life.

He recommended, as the four areas where major improvement in our industrial mobilization actions can be most readily made:

1. Improvement of the functioning of government (which we recognize is of necessity a slow process).

2. The improvement of the contractor's performance through a better knowledge on his part of the weapon's design, performance, and potential--(and this involves a carefully evaluated increased dissemination of security information to the contractor).

3. Through their increased knowledge, an increased use of civilian talents on military problems.

4. A sympathetic, mutual understanding of the problems of business and government in order to better meet the problems of today plus the anticipated problems of tomorrow.

Now, you will notice that appendix "A" is based on June 1955 Soviet capabilities. We all know that this capability is increasing. Now can you estimate the effect of an attack three or more years from now instead of next June? I can't give you an exact answer to this, but we have issued to you an article from the June 1954 issue of the Bulletin of the Atomic Scientists, entitled "The Remedies versus the Menace," by Professor Hornell Hart of Duke University. We plan to ask him to give a talk here next May directly about this problem.

This increase in Soviet capability is important now, but, when the capability reaches the point where they can put about 100 multimegaton bombs on 100 of our largest metropolitan areas, then the relative size of U. S. and Soviet stockpiles will lose any significance. The attack used for our problem is not that heavy.

The point I am trying to make is that your estimates must be dynamic and not static. You should not say "The attack will occur on such and such a date." It is obvious that the attack may never occur.

I personally believe that the probability that an attack will occur increases in proportion to our degree of unpreparedness. So I suggest that you may want to include a logical and realistic discussion of the power of the attack, and the effect upon your program for readiness of an earlier or later attack date.

I also want to suggest that any additional assumptions you wish to add should be very carefully considered. Let me give you some specific examples of the types of assumptions you might add. Mr. Hanson Baldwin has several in an article in the September 11 issue of the Saturday Evening Post under the title of "Let's Quit Talking Nonsense About the Cold War." He lists seven commonly stated assumptions which he says are unfounded.

1. War is inevitable.

2. Russia can't be licked without the A bomb.

3. There is no defense against the A bomb.

4. We don't need the world.

5. Navies are finished.

6. The French won't fight.

7. We must get a final solution.

If you want additional assumptions, there is a good starting list for your committee to discuss.

Personally, I am quite intrigued with the last one. Suppose I put on a Russian cap for a moment and tell you that my plan for conquest of the United States does not, in this decade, include a final solution. I plan to take one step at a time, and I think you must agree that since 1945 my steps have been pretty successful. So now I will tell you that I believe I have sufficient air force and a large enough stockpile to attack you successfully, and I plan to do it right now--tomorrow morning.

First, I intend that you shall not be able to hit me back. So I am going to destroy all the SAC bases in the United States and overseas,

all the SAC airplanes, and all the atomic-bomb storage and production plants. There will be some Americans killed, but not a great many. Secondly, I am going to select only the few resources you need to restore your retaliatory capability, and I am going to hit them and, if necessary, I will keep hitting them. Third, I am going to destroy all the ports in Europe. As for your population, and your other industries, I am not going to touch them. You can build tanks and ships and guns until they run out of your ears, and I don't care at all. You can't hit me and you can't land your weapons in Europe. In three years I will own all the resources in Europe, and that's my first step. It is not a final solution.

I'll take off my Russian cap now and, if this were not supposed to be a lecture on our problem, I would shoot some holes in my Russian plan. But, to go back to my original topic of Mr. Baldwin's assumptions, I conclude that there is plenty of latitude for you to do some serious thinking.

For another topic, let's discuss a moment what you will do with the statistical data in appendix "A" and how you can translate these data into a concept of overall damage. First, of course, this is direct damage only. It does not reflect shock and panic. It does not tell you about any "take to the hills" attitude of people who live in a city which was not hit. It does not discuss the stock market, or the Federal Reserve System, or fuel distribution, or where your wife will find canned milk the next day if she is still alive. We will not discuss these matters now. Each unit of the year's course will give you a background for estimating the secondary impact of direct damage.

If you refer to the Curriculum Book for the final unit last year, you will find that the supporting lectures included eminent authorities on such topics as "The Economic Consequences of Atomic Attack Upon the United States." "The Physiological Impact of an Atomic Attack Upon the United States," and "Congressional Attitude Towards the Current Threat Against the United States." We will have similar lectures and seminars at the start of Unit IX this coming May which will be focused directly on supporting aspects of this specific final problem.

The lectures you attend with the War College, and the work of previous classes filed in our library, will open additional sources of information to you. I refer you particularly to the four published reports of last year's class--two of these have come out already and two more will be out shortly--SR 54-22, 26, 28, and 32. Many of the lectures you have already had in the course will be of direct interest to you in this final problem. For instance, I feel that the lecture by Mr.

John F. Hilliard, Deputy Assistant Director of Manpower of ODM, on the 14th of October, will be of great benefit to you. By the time you are ready to tackle this problem, many of these lectures will have been published, and will be in your hands; or you can always secure typescripts of them in our library.

In other words, the data in appendix "A" is only part of the total damage, and the translation into a total concept is part of your problem.

Although I said that we do not require any reading prior to May 3, there are several books which are both interesting and informative. I will give you the titles of two in case you do want to read them in the next few months. The first is "The Hydrogen Bomb," by James Shepley and Clay Blair. Our library will have a copy soon and the War College has two copies. The second book is "The New Force," by Ralph Lapp. The Post Library has a copy, our library has a copy, and the War College Library has a copy. These books are stimulating, but you must evaluate their validity and the motives of the authors.

Now, finally: How complete and detailed a solution should you present? Let me suggest this approach: We estimate that you will have available to you for committee meetings and free time about 67 periods before the oral presentations are due. You will have about seven days after that to assemble and edit all the rough drafts submitted by individual members of your committees, but I think you should plan to finish all rough drafts prior to the oral presentation.

At 1-1/2 hours per period, and for 17 members of a group, this amounts to over 1700 man-hours. This is exclusive of time spent in lectures and seminars, but does include any wasted time due to an imperfect coordination of the work of all the committee members. In other words, if each of you were supposed to tackle this problem individually, you would have 1700 hours. Suppose you divide this into 900 hours on research and 800 hours on writing. I think you will agree that you can write a considerable amount in 800 hours, even including the thinking you must do to convert your research into a well organized and logical presentation. I do not minimize the pressure and the importance of good committee organization and planning, but I do not sympathize with a feeling of futility or believe that the job is too big for anything worthwhile to result because of the deadline.

A chemist once estimated that the chemical elements in the human body were worth 98 cents at current market prices. This is an absurd

valuation of the potential that you have here in this group. Nuclear physicists, using the formula E equals MC2, can calculate the energy potential of each atom of the human body. Each pound of your body, by this formula, will produce 11,400 kilowatts. At an average weight of 150 pounds, and with a student body of 136, we have a total of 232,560 megawatts for this class. Industrial power in Washington costs about one cent per kilowatt hour, so the energy of this class is worth, at industrial rates, $2,325,600 per hour. Expressed in other terms, this energy is equivalent to over 311 million horsepower, which will lift the Washington monument one foot in 17 minutes.

I am sure that you have an opportunity to contribute a real service to our country. I know that each part of the course will furnish you tools to apply to this job. And, with your atomic potential of 232,560 megawatts, I believe you can initiate, by your report, a chain reaction of interest and activity. The entire faculty wishes you the best success in your efforts, and we offer you our assistance and support.

Thank you.

NOTE: One inclosure--Mobilization Branch, Unit IX, "Final Problem," dated 1 November 1954.

(8 December 1954--250)gw

INDUSTRIAL COLLEGE OF THE ARMED FORCES
Washington, D. C.

1 November 1954

Mobilization Branch
Unit IX

FINAL PROBLEM

1. Purpose.

To develop a comprehensive plan for the partial and total economic mobilization of the United States.

2. Scope.

The scope of the problem includes:

a. A study and analysis of the conditions and problems of an economic mobilization which is suited to the present and foreseeable threat to our national security, taking into consideration:

(1) The probable effects of a major atomic and/or thermonuclear attack which may include the additional elements of radioactive fall-out, and radiological, biological and chemical warfare.

(2) The physical and psychological shock effects of such an attack upon our government, our people and our life.

(3) The war, following such an attack, might last several years or might be of extremely short duration.

b. An evaluation of Federal organizations currently concerned with economic mobilization and of their responsibilities, authorities, actual functioning, plans and planning, and programs. Major deficiencies and gaps should be noted, taking into consideration:

(1) The current assignment of economic mobilization responsibilities to Federal agencies.

(2) The actual functioning of the organizations considered.

(3) The plans, programs and measures now in effect.

(4) Measures taken prior to, and to be taken subsequent to, the start of an all-out war.

(5) Measures for continuity of production and for speeding recovery and rehabilitation.

c. The preparation of a comprehensive plan for economic mobilization taking into consideration:

(1) The partial implementation needed for a peripheral war and the time phasing for partial and full mobilization.

(2) The objectives to be kept in mind during cold war, peripheral war and all-out war, and the objectives for reconversion and readjustment to post-war conditions.

3. Assumptions. (NOTE: Students will be divided into two groups. Group A will use assumption 3b(5)a. Group B will use assumption 3b(5)b.)

a. The basic assumption used as a common starting point for each committee's report is:

(1) The very real probabilities for the next generation, that:

(a) We shall continue in a long period of cold war, always threatened with peripheral war or all-out war.

or (b) We shall become involved in, and must be prepared for, limited peripheral war which could (but would not inevitably) turn into all-out war.

or (c) We shall become involved in an all-out war, with or without allies.

b. The following corollary assumptions will be used:

(1) The hypothetical initial attack upon the United States which would initiate an all-out war is given in Appendix A. (This appendix lists targets hit, direct industrial damage and casualties, and is classified "Secret").

(2) The United States will not initiate a preventive war.

(3) The USSR will attempt to destroy our retaliatory capacity wherever located, believing that this effort will be successful.

(4) A major atomic attack will also be made by the USSR against U. S. population.

(5a) An all-out war will last several years. (To be used by Group A only)

(5b) An all-out war will be of short duration. (To be used by Group B only)

c. Additional assumptions and factors considered valid may be stated by each committee in order to limit or clarify the basic and corollary assumptions stated above.

4. Required.

Preparation of a committee report in four parts:

a. Part I. A statement of the basic and corollary assumptions used by the committee as guides in the preparation of their report, together with an indication of the relative weight or importance of the assumptions. An estimate of the total damage to the U. S. including secondary (psychological, physical and sociological) effects resulting from the direct damage.

b. Part II. A comprehensive evaluation of Federal organizations currently concerned with economic mobilization, judged from the viewpoint of the committee's assumptions. As a minimum, consideration should be given to any of the following aspects which are considered pertinent:

(1) Requirements
(2) Resources (exclusive of manpower)
(3) Manpower
(4) Production
(5) Procurement
(6) Stabilization, financing and controls
(7) Organization, management, legislation and authorities
(8) Public opinion and propaganda
(9) International aspects

c. Part III. Preparation of a practical and feasible solution of the problem of economic mobilization for an all-out war, together with conclusions and recommendations for time phasing. The degree of implementation, and the time phasing for the lesser situation of peripheral war will be discussed. (Group A will assume that an all-out war will last several years. Group B will assume that the war will be of short duration.)

(1) List briefly the current policies, procedures and organizations which are adequate and are to be continued, and

(2) Identify in greater detail the additional proposals, legislation, organizational changes, and new programs and policies intended to eliminate the deficiencies and gaps noted in Part II.

(3) Include feasible measures to restore our strength and potential as well and as quickly as possible if the attack should occur in the near future.

(4) Include a brief statement of the reconversion and readjustment objectives to be kept in mind during the course of partial or full economic mobilization.

d. Part IV. Discuss the applicability and defects of the proposed plan if the all-out war:

(1a) Should be of short duration (Group A only).

(1b) Should last several years (Group B only).

L. R. Bartlett Jr.

1 Incl
Appendix A

L. R. BARTLETT, JR.
Colonel, USAF
Chief, Mobilization Branch

Unclassified Portion of
APPENDIX A

City No.	Bomb No.	Dice Roll	HIT MISS(if indented)	Yield	Coordinates Northing	Easting	Zone
1	1	4	New York	1 MT	4,512,650	586,450	18
	2	5	New York	1 MT			
2	3	2	Chicago	1 MT	4,610,377	440,152	16
	4	1	Chicago (Gary)	.8 MT	4,603,081	471,796	16
3	5	1	Los Angeles	1 MT	3,738,850	381,560	11
	6	1	Los Angeles	.8 MT	3,756,000	373,700	11
4	7	2	Philadelphia	1 MT	4,422,350	486,100	18
	8	5	Detroit	1 MT			
5	9	1	Detroit	1 MT	4,695,200	331,500	17
6	10	3	Boston	.8 MT	4,691,000	327,800	19
7	11	4	San Francisco	1 MT	4,179,350	549,150	10
	12	3	San Francisco (Oakland)	50 KT	4,184,550	562,850	10
8	13	4	Pittsburgh	.8 MT	4,478,900	591,200	17
	14	2	Pittsburgh	1 MT	4,479,650	580,950	17
9	15	2	St. Louis	.8 MT	4,279,000	739,350	15
	16	3	St. Louis	1 MT	4,280,200	749,200	15
10	17	2	Cleveland	.8 MT	4,590,300	443,950	17
	18	1	Cleveland	50 KT	4,590,500	430,900	17
	19	3	Cleveland	50 KT	4,596,600	448,550	17
11	20	4	Washington	1 MT	4,307,239	323,369	18
	21	5	Baltimore	1 MT			
	22	6	Baltimore (G. Martin)	50 KT			
12	23	2	Minneapolis	1 MT	4,980,625	479,725	15
13	24	2	St. Paul	1 MT	4,977,100	493,175	15
14	25	3	Buffalo	50 KT	4,742,900	677,650	17
	26	6	Buffalo	50 KT			
	27	6	Buffalo(Niagara Falls)	50 KT			
	28	5	Cincinnati	50 KT			
15	29	3	Cincinnati	50 KT	4,335,900	719,250	16
	30	1	Cincinnati	50 KT	4,337,665	725,600	16
	31	5	Milwaukee	50 KT			
16	32	2	Milwaukee	50 KT	4,768,867	425,933	16
	33	5	Kansas City	50 KT			
17	34	2	Kansas City	50 KT	4,325,350	364,550	15
18	35	2	Houston	50 KT	3,295,475	272,361	15
	36	3	Houston	50 KT	3,292,344	277,942	15
	37	5	Houston	50 KT			
19	38	1	Providence	50 KT	4,634,600	299,200	19
	39	6	Providence	50 KT			
	40	5	Seattle	50 KT			
	41	6	Seattle	50 KT			
20	42	1	Portland	50 KT	5,047,950	524,350	10
	43	6	Portland	50 KT			
	44	4	Portland	50 KT	5,022,500	531,100	10
21	45	4	New Orleans	50 KT	3,315,980	780,412	15
	46	3	New Orleans	50 KT	3,318,480	786,905	15
	47	6	Atlanta	50 KT			
	48	5	Atlanta	50 KT			
22	49	3	Dallas	50 KT	3,629,550	707,650	15
	50	5	Dallas	50 KT			

	51	5	Louisville	50	KT			
23	52	3	Louisville	50	KT	4,232,599	611,076	16
	53	6	Denver	50	KT			
24	54	4	Denver	50	KT	4,393,389	503,215	13
25	55	3	Birmingham	50	KT	3,707,514	512,946	16
	56	3	Birmingham	50	KT	3,708,837	519,081	16
26	57	2	San Diego	50	KT	3,613,092	489,143	11
	58	1	San Diego	50	KT	3,623,458	483,489	11
	59	6	Indianapolis	50	KT			
27	60	1	Indianapolis	50	KT	4,401,649	577,851	16
	61	5	Youngstown	50	KT			
28	62	4	Youngstown	50	KT	4,549,050	530,025	17
29	63	1	Albany	50	KT	4,723,200	601,250	18
30	64	2	Schenectady	50	KT	4,740,050	585,700	18
31	65	3	Columbus	50	KT	4,424,556	325,955	17
	66	2	Columbus	50	KT	4,425,554	331,639	17
32	67	1	San Antonio	50	KT	3,256,242	551,001	14
	68	6	San Antonio	50	KT			
33	69	1	Miami	50	KT	2,852,364	578,899	17
34	70	2	Rochester	50	KT	4,785,200	287,000	18
	71	2	Rochester	50	KT	4,779,450	287,400	18
35	72	4	Memphis	50	KT	3,894,262	770,649	15
	73	1	Memphis	50	KT	3,889,490	768,890	15
36	74	3	Dayton	50	KT	4,404,806	738,575	16
	75	4	Dayton	50	KT	4,402,562	743,792	16
37	76	4	Norfolk	50	KT	4,077,130	381,779	18
	77	3	Norfolk	50	KT	4,080,842	385,570	18
	78	5	Allentown	50	KT			
	79	6	Bethlehem	50	KT			
	80	6	Toledo	50	KT			
38	81	3	Toledo	50	KT	4,614,100	285,350	17
39	82	3	Wilkesbarre	50	KT	4,566,100	425,500	18
	83	5	Omaha	50	KT			
40	84	1	Council Bluffs	50	KT	4,571,411	260,050	15
41	85	3	Ft. Worth	50	KT	3,627,266	646,459	14
	86	6	Ft. Worth	50	KT			
42	87	1	Hartford	50	KT	4,627,950	691,150	18
	88	3	Hartford	50	KT	4,622,750	692,350	18
43	89	4	Wheeling	50	KT	4,435,400	525,050	17
	90	5	Syracuse	50	KT			
44	91	2	Knoxville	50	KT	3,984,920	236,080	17
	92	5	Phoenix	50	KT			
45	93	2	Richmond	50	KT	4,158,950	283,050	18
	94	6	Oklahoma City	50	KT			
	95	5	Charleston, W,Va.	50	KT			
46	96	1	Nashville	50	KT	4,001,825	519,775	16
47	97	1	Jacksonville	50	KT	3,355,840	430,514	17
48	98	2	Harrisburg	50	KT	4,459,300	341,350	18
49	99	4	Johnstown	50	KT	4,464,550	677,050	17
50	100	3	Sault Ste. Marie Locks	50	KT	5,154,488	708,533	16