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1943
COMBINED CHIEFS OF STAFF

THE EFFECT OF WEATHER ON OPERATION "OVERLORD"

Memorandum by the British Chiefs of Staff

1. The following examination has been made regarding the limitations imposed by weather conditions on the postponement of Operation OVERLORD.

2. Suitable weather conditions are required for two phases of the operation, firstly, the assault for which a four-day fine weather period is required; secondly, the maintenance and build-up period for which suitable weather for a decreasing degree of beach maintenance is required for about three months.

THE ASSAULT

3. In order to launch the assault a quiet spell of four days with winds of force 3 or less is desirable. Over ten consecutive years there were quiet spells for four or more consecutive days on the following number of occasions:

<table>
<thead>
<tr>
<th>Month</th>
<th>Times</th>
</tr>
</thead>
<tbody>
<tr>
<td>April</td>
<td>18</td>
</tr>
<tr>
<td>May</td>
<td>21</td>
</tr>
<tr>
<td>June</td>
<td>19</td>
</tr>
<tr>
<td>July</td>
<td>16</td>
</tr>
<tr>
<td>August</td>
<td>23</td>
</tr>
<tr>
<td>September</td>
<td>17</td>
</tr>
<tr>
<td>October</td>
<td>14</td>
</tr>
</tbody>
</table>

It will be seen that there is no serious deterioration in the chances of launching the assault between the months of May and September with the exception of July, where the incidence of a fine spell is only slightly less than in the month of June. It is therefore considered that, purely from the assault aspect, the operation could be postponed up to the month of September.

4. For tidal reasons the assault is limited in each lunar month to two periods of five or six days, which occur at times of full and new moon. The air lift can only be carried out in the full moon period. It therefore follows that if the full moon period is missed on account of the weather conditions being unsuitable, the assault must be postponed for 24 days. By sacrificing the air lift this postponement could be reduced to 10 days.
AIR FACTORS AFFECTING THE ASSAULT

5. a. For fully effective operation of air forces the following conditions must be satisfied:

<table>
<thead>
<tr>
<th>Condition</th>
<th>Night</th>
<th>Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum horizontal visibility</td>
<td>5 miles</td>
<td>5 miles</td>
</tr>
<tr>
<td>Minimum cloud base above ground level</td>
<td>3,000 feet</td>
<td>11,500 feet</td>
</tr>
<tr>
<td>Maximum cloud</td>
<td>6/10</td>
<td>10/10</td>
</tr>
<tr>
<td>Maximum wind at ground level</td>
<td>20 m.p.h.</td>
<td>20 m.p.h. (if airborne forces are used by day)</td>
</tr>
</tbody>
</table>

Minimum moon
5 days each side of full.
Moon 20° above horizon.

b. If high level bombing is abandoned, the cloud conditions by day are then limited by the requirements of the fighter cover over shipping and beaches. These are 10/10 at not less than 5,000 feet.

c. The chances of obtaining these conditions are not yet available, but it is evident that they will lengthen the odds against launching the assault to some extent, although settled summer weather suitable for the landing will most probably be suitable for the air operations.

MAINTENANCE AND BUILD-UP PERIOD

6. COSSAC has stated that, making full use of every captured port, large and small, 18 divisions must be maintained over the beaches during the first month of the operations, 12 divisions during the second month, and a number rapidly diminishing to nil during the third month. It is believed that the use of MULBERRIES will approximately halve this commitment for beach maintenance. Therefore, during this period there will be at first a considerable, and later a gradually dwindling dependence on fine weather conditions. In assessing suitable weather for carrying out beach maintenance any day with wind of not more than Force 3 on shore and not more than Force 4 off shore has been accepted. In the OVERLORD area the average number of suitable days per month is as follows:

<table>
<thead>
<tr>
<th>Month</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>April</td>
<td>21</td>
</tr>
<tr>
<td>May</td>
<td>23</td>
</tr>
<tr>
<td>June</td>
<td>25</td>
</tr>
<tr>
<td>July</td>
<td>25</td>
</tr>
<tr>
<td>August</td>
<td>24½</td>
</tr>
<tr>
<td>Month</td>
<td>Percentage</td>
</tr>
<tr>
<td>----------</td>
<td>------------</td>
</tr>
<tr>
<td>September</td>
<td>23 1/2</td>
</tr>
<tr>
<td>October</td>
<td>18 1/2</td>
</tr>
<tr>
<td>November</td>
<td>20</td>
</tr>
<tr>
<td>December</td>
<td>20</td>
</tr>
</tbody>
</table>

It is apparent from the above figures that a marked deterioration does not occur until October. Although the months of October, November, and December appear to provide a reasonable number of quiet days, it is considered that this proportion cannot be fully relied on owing to the severe weather which may occur during unsuitable days, thereby producing conditions of sea or swell which will render beach maintenance impracticable on the subsequent quiet day or days.

7. It is impossible to calculate what loss in expectation of suitable maintenance days can be accepted by COSSAC during the second and third months of the beach maintenance period without a very intimate knowledge of his maintenance and build-up plan; but it would appear that weather should be suitable for sufficient beach maintenance at least up to the end of September and possibly, in view of the dwindling commitment in this respect, up to the middle or end of October.

**CONCLUSION**

8. It is not possible to submit a firm recommendation on this subject, but from the limited facts available for this brief examination, there does not appear to be any overriding reason why the assault could not be carried out up to about the middle of July.

9. This means that the target date should be in the middle of June to allow for a postponement of 24 days in case weather conditions are unsuitable.

10. Thus if the target date is mid-June and the air lift is not sacrificed, only two periods of four or five days when Moon and Tide conditions are suitable will occur in 1944; and these must coincide with a four day spell of fine weather.
COMBINED CHIEFS OF STAFF

AMPHIBIOUS OPERATION AGAINST THE SOUTH OF FRANCE

Note by the Secretaries

The enclosure is a report by the Combined Staff Planners prepared with the collaboration of the Combined Administrative Committee.

H. REDMAN,
F. B. ROYAL,
Combined Secretariat.

ENCLOSURE

AMPHIBIOUS OPERATION AGAINST THE SOUTH OF FRANCE

Reference: CCS Memo Directive
1 December 1943

1. In accordance with the instructions of the Combined Chiefs of Staff, we have examined the agreed operations against the South of France on the following premises:

   a. That this operation should be carried out with a minimum of two assault divisions.

   b. That the necessary resources shall not be found at the expense of OVERLORD.
2. We have in addition assumed:

   a. That operation ANVIL will approximately coincide with OVERLORD.

   b. In Italy we have reached the Pisa-Rimini line and thereafter as strong pressure as possible is maintained consistent with the provision of forces for ANVIL.

   c. The Mediterranean forces will not be engaged in offensive operations elsewhere.

3. We have made tentative estimates, in the absence of any detailed operational plan, of the resources which will be required for the operation under two hypotheses where these apply:

   a. That the assault is carried out within range of shore-based fighter aircraft.

   b. That the assault is carried out beyond the range of shore-based fighter aircraft.

4. It appears that the following cannot be found from the resources which under present agreements will be available to General Eisenhower in the Mediterranean at the time of the operation:

   A. Naval Forces

   On the assumption that adequate shore-based, short-range fighter cover is provided:

   (1) Additional escorts, probably 10 to 20.

   (2) 2 AA fighter direction ships.

   (3) In the event that the build-up exceeds one division before D plus 8, nine A/S A/A escorts will be required for each extra division.

   This indicates that if a rapid build-up is necessary, more escorts will be required.

   In the event that adequate shore-based short-range air cover can not be provided the following will be needed in addition to those above.
(1) 9 to 12 escort carriers with fighters.

(2) 6 AA cruisers.

(3) 18 screening vessels.

To meet these deficiencies, we must draw on other theaters, most probably from the Atlantic. It might prove possible for four CVE and six escorts which are taking part in BUCANEER to return to the Mediterranean in time. This, however, will be conditioned by the availability of fighters for reequipping these escort carriers. We have assumed that port parties will be provided from within the Mediterranean.

B. Land Forces

Certain service forces, the number and type of which cannot be determined without careful study by AFHQ.

On the assumption that French divisions will participate, the requirement will be lessened if, as recommended by General Eisenhower, some of the French divisions scheduled for activation are not formed but are converted to service forces.

C. Air Forces

The troop carrier resources in the Mediterranean will only be sufficient to lift one brigade and if the detailed plan requires a second brigade lift, this will have to be provided.

D. Shipping

(1) Personnel Shipping.

The QUADRANT allotment of personnel shipping for 80,000 troop lift in the Mediterranean expires on 31 March. Initially, personnel shipping for 32,000 will be required until after the assault, and during the period of build-up, a total personnel lift for 15,000 will be necessary. It is proposed to use cargo ships for personnel lift to the maximum extent possible.
(2) MT/Stores Shipping.

The following sailings within the Mediterranean will be required in addition to those required for the maintenance of the remainder of the theater:

- First month — 128
- Second month — 90
- Third month — 75
- Fourth and subsequent months — 40

This can obviously be provided but until the present shipping examination is completed, we cannot assess the cost.

E. Assault Shipping and Craft

Assault lift for two divisions can be provided. Methods of providing this are shown in Appendix "A."

5. We consider that General Eisenhower should be directed to prepare an outline plan for the agreed operation against the South of France as a matter of urgency. We have accordingly prepared a directive to General Eisenhower, and this is attached at Appendix "B."

RECOMMENDATION

6. That the directive in Appendix "B" be sent to General Eisenhower.
APPENDIX "A"

1. We have examined the resources available for the agreed operation against the South of France on the following premises:

   a. That this operation should be carried out with a minimum of two assault divisions, and;

   b. That the necessary resources shall not be found at the expense of OVERLORD.

2. The assault shipping and craft which we estimate will be available and serviceable in the Mediterranean for an assault on Southern France at about the time of OVERLORD is as follows:

   **Assault Shipping Craft**

<table>
<thead>
<tr>
<th>British</th>
<th>U.S.</th>
<th>Total</th>
<th>Personnel</th>
<th>Lift</th>
</tr>
</thead>
<tbody>
<tr>
<td>L.S.I.(L)</td>
<td>3</td>
<td>—</td>
<td>3</td>
<td>3,600</td>
</tr>
<tr>
<td>L.S.T.</td>
<td>10</td>
<td>22</td>
<td>32</td>
<td>10,000</td>
</tr>
<tr>
<td>L.C.T.</td>
<td>30</td>
<td>30</td>
<td>60</td>
<td>1,800</td>
</tr>
<tr>
<td>L.C.I.(L)</td>
<td>45</td>
<td>55</td>
<td>100</td>
<td>20,000</td>
</tr>
<tr>
<td>L.S.I.(M)</td>
<td>1</td>
<td>—</td>
<td>1</td>
<td>400</td>
</tr>
<tr>
<td>L.S.I.(H)</td>
<td>1 (a)</td>
<td>—</td>
<td>1</td>
<td>2,000 (by using the LCT for unloading other ships after the LCT have discharged their original lift as shown above.)</td>
</tr>
<tr>
<td>M.T. Ships</td>
<td>16</td>
<td>—</td>
<td>16</td>
<td>3,200</td>
</tr>
<tr>
<td>L.S.C.</td>
<td>1</td>
<td>—</td>
<td>1</td>
<td>—</td>
</tr>
<tr>
<td>L.S.G.</td>
<td>1</td>
<td>—</td>
<td>1</td>
<td>—</td>
</tr>
<tr>
<td>L.C.M.</td>
<td>85*</td>
<td>—</td>
<td>85</td>
<td>—</td>
</tr>
</tbody>
</table>

   * U.S. and British

(a) Fitted as a brigade headquarters ship. The British state that its allocation is not firm.

3. The above lift in terms of divisions is estimated to be as follows:

   a. U.S. - A task force to include one division in the assault and 2/3 of a division embarked as a follow-up or the equivalent thereof;

   **OR**

   b. British - 3 assault and 2 follow-up Brigades.
4. It is estimated that, to meet the full requirements of a minimum of two assault divisions, a total force of 45,500 personnel and 7,740 vehicles should be provided. The lift available is short by 6,500 personnel and 3,220 vehicles.

5. The above deficit can be overcome by the provision of 3 combat loaders, 12 MT ships, 26 LST and 31 LCT so that all required vehicles are available on D-day. If required, these 26 LST's can bring with them 12 to 15 sets of pontoon strips.

6. We find that from U.S. resources 26 LST and 26 LCT can be supplied from early spring production previously allocated Pacific and arrive in the Mediterranean by 15 April. The remaining 5 LCT can be supplied from U.S. LCT's now in the Mediterranean and scheduled for OVERLORD. The United States is sending 24 additional LCT's to OVERLORD beyond the QUADRANT commitment, hence these 5 LCT's are not materially at the expense of that operation. The United States can supply 3 XAP's. We consider that the additional MT ships can be supplied from the shipping of that category now pooled in the Mediterranean under AFHQ.

7. The above LST's and LCT's sent from the United States represent a one month's allocation to the Pacific the majority of which were due to be available for the TRUK operation in July. It may be possible by withdrawing some of these craft from the South Pacific to make up the TRUK deficiency thus created, otherwise the operation may be delayed.

8. The requirement for LSH (AGC) are 2; OVERLORD requires 3. There are 2 British* and 3 U.S.** available which can be allocated to meet these requirements.

* H.M.S. LARGS
  H.M.S. HILARY

** U.S.S. ANCON
   U.S.S. BISCAYNE
   U.S.S. COTOCTIN

9. Special landing craft types for the assault support must come from those now available in the Mediterranean. Since these are few, the naval forces must be arranged to properly provide close support for the assault.

Appendix "A"
APPENDIX "B"

DRAFT DIRECTIVE TO GENERAL EISENHOWER

1. The Combined Chiefs of Staff have agreed that an operation is to take place in conjunction with OVERLORD, with the object of establishing a bridgehead on the South Coast of France and subsequently to exploit in support of OVERLORD.

2. You will prepare in consultation with COSSAC and submit to the Combined Chiefs of Staff, as a matter of urgency, an outline plan for the operation.

3. The exact date for OVERLORD has not yet been decided upon, but it is to take place at the most suitable date during May 1944. You will be informed of the date once this has been decided, and operation ANVIL will be timed approximately to coincide with operation OVERLORD — the exact date to be determined in consultation with COSSAC.

4. You will be given the assault shipping and craft for a lift for at least two divisions (each with two brigades in the assault).

5. You will inform the Combined Chiefs of Staff of your requirements which cannot be met from the resources which will be at your disposal in the Mediterranean on that date. In assessing your resources you should assume that your forces have reached the Pisa-Rimini line and that as strong pressure as possible is maintained, consistent with the forces required for ANVIL; also that Mediterranean forces will not be engaged in offensive operations elsewhere.