Rice drop procedures. 1964/1972

[s.l.]: [s.n.], 1964/1972

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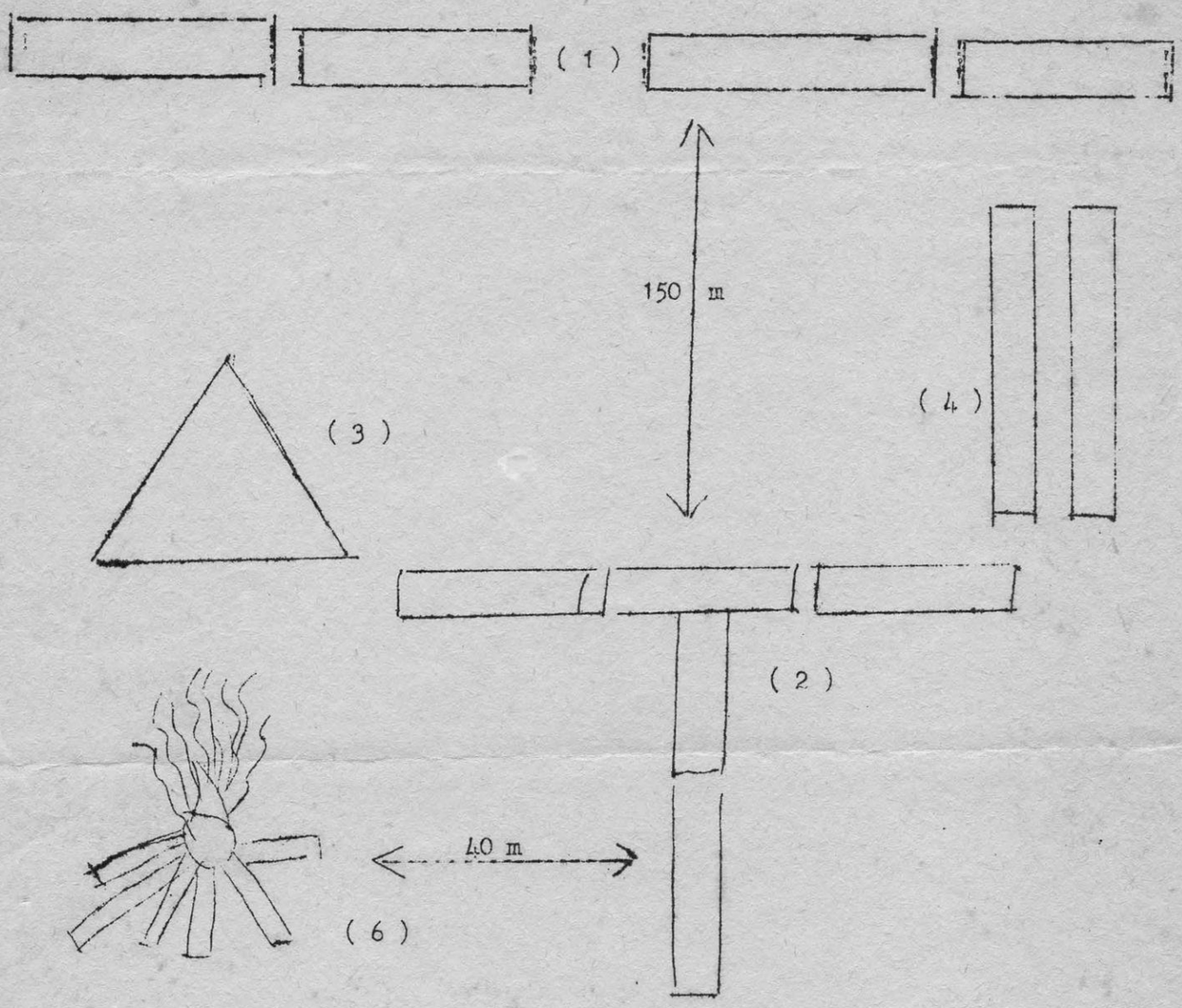

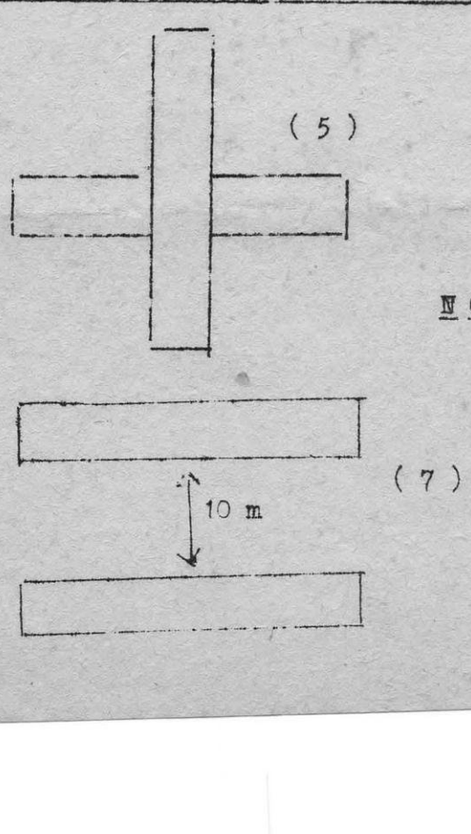

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5- SIGNAL INTERDICTION DE LARGAGE
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6- FUMEE.
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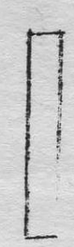

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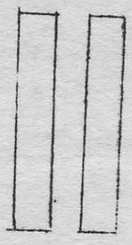

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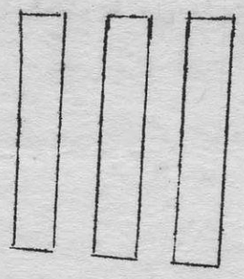

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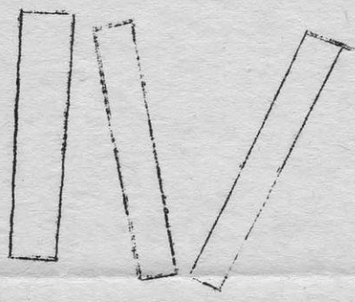

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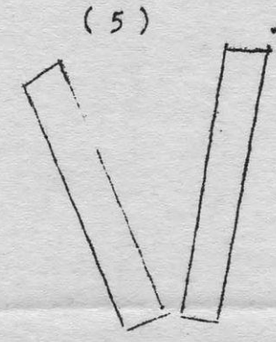

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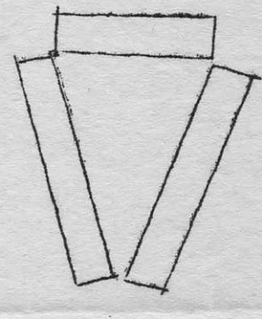

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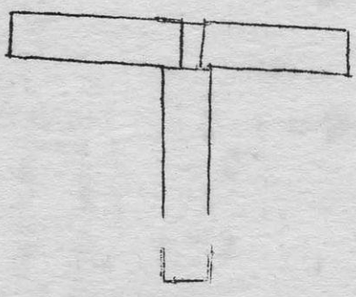

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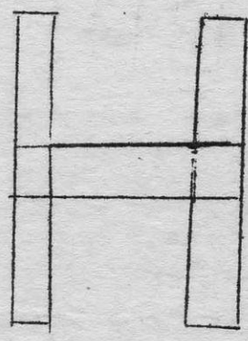

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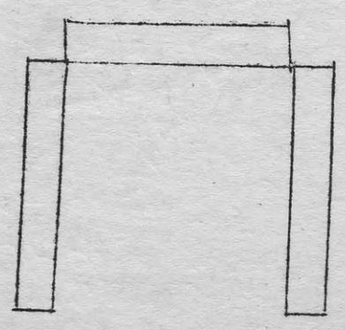

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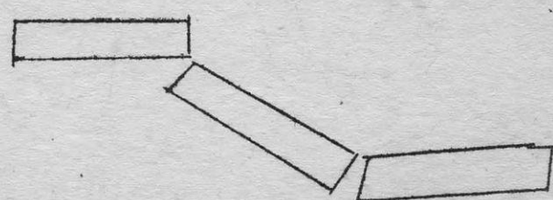

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MEMORANDUM

TO : See Distribution DATE: 3 February 1966

FROM : FIC/VTE REF. No. FIC - 3 - 1966

SUBJECT: Pilot Debriefing 14 January to 2 February 1966

Comments from pilots that require attention are consolidated below:

Airfield or DZ	Pilot Comment
DZ UH 7660	The correct signal is "U" not TA as shown on the Rice Requirement Sheet.
DZ UH 8263	Three (3) trips to this DZ, no signal, no activity and no drop.
DZ PC 9979	DZ is too small for C 46 drops recommend using a C 47.
DZ TG 4374	The correct signal is "P" not "F" as listed on the Rice Requirement Sheet.
DZ TG 5513	Two trips to this DZ, no signal, no people, no drop.
DZ TG 6880	Signal is formed by three stripped tree trunks with a red cloth to the side, very difficult to see. Several trips have not seen the signal. Recommend that the signal be move.
DZ UF 2098	DZ is too small for drops, recommend either relocate or inlarge.
DZ UG 4216	DZ is very small and badly located. Recommend making drops to strip (LS 95) or relocate the DZ.
DZ UG 8488	Four (4) trips made to this DZ, no signal, no people, no drop.
DZ TH 2242	This DZ has a permanent signal staked out, this defeats the purpose of the signal system.
DZ UG 8680	Displays "F" in leiu of "I" in what appears to be an attempt to steal rice from UG 7585, whose signal is "F".
LS 109	Needs a wind sock.
LS 158	Needs a wind sock.

The following sites have non standard wind socks: LS 36, 185, 113, 14, 13, 2, 95, and 126.

CC: GML
M/ATOG
ASB
SOM/VTE
GMC
MF/VTE File

OTTO D. SUNDSTAD
SOSP/VTE

OS-4 R2

Ban Houei Sai

AHAMCOR
D2s

MEMORANDUM

January 10, 1967

TO: Distribution List
THRU: Alex. P. Mavro, Executive Officer
FROM: William F. Sparks, Chief, Air Support Branch

SUBJECT: Landing and Drop Zone Signals

The Ambassador has recently reiterated his policy regarding the display of security signals at doubtful sites in Laos and has directed that appropriate action be taken to assure compliance with the following:

1. Signals displayed at sites which are suspect shall not be considered valid unless a pilot actually observes the signal being laid out.

2. When a pilot approaches a questionable area where the situation is doubtful, he shall use every means at his disposal to ascertain that the area is safe prior to landing/air dropping.

Day old signals and in some exceptional circumstances hour old signals, should be suspect when operating in known insecure areas. A case in point was the unexpected ambush of a Helicopter at TH 0688 resulting in one fatality, serious injuries, and near aircraft distruction. Although the signal was correct, the area had been over-run by unfriendlies shortly prior to the arrival of the Helicopter.

There are reports of a trend starting in the LS 20 - LS 36 area wherein sites are constructing permanent signals or are putting out signals (held down with stones) for the entire day. Sites 74 and 15 are examples of the former and Sites 215 and 76 of the latter.

All Area Coordinators are enjoined to redouble their efforts in assuring the Ambassador's policy is being carried out to the letter by informing the people of their responsibility for the proper and timely display of signals.

All pilots are hereby requested to include in their trip report all cases of noncompliance when being debriefed by FIC.

AIR:WFSparks:ws:1/10/67

DIST: F, OD, EO 2, RDD 10, Air America 100, Continental 50, FIC Udorn, FIC Vientiane, AIR 2, C&R 3

Mr. Kuhn / Smith

Office Memorandum · UNITED STATES GOVERNMENT

TO : Mr. H.W.Brady, A.Oniel, AID/RR

DATE: July 24, 1968

FROM : P.J.Buechler, OD/Commodities

SUBJECT: Field tests - Plastic Sacks

DATA:
1. Source of bags - Japan - (PIO/C 80193RR - 80264RR)
2. String - Kuralon - (PIO/C 80193RR - 80264RR)
3. Commodity - cornmeal and rice
4. Units for drop - 3 pallets each, rice - cornmeal
5. Unit - 40Kgs/unit. 2 plastic sacks/unit
6. Cornmeal pallet = 7 sacks
7. Rice pallet = 9 sacks
8. Sewing: 2 pallets single strand
2 pallets double strand
2 pallets quadruple strand
9. Time, Date & weather - 1130 - 1200 hrs., July 11, 1968, favorable.
10. Test site - S-246 San Son Tr 5896
11. Drop plane - C-46 - 86N
12. Personnel on site - Ernie Kuhn - Phil Buechler

Mr. Kuhn and I arrived on site from S-20 as 86N was coming down to drop altitude. The "Big Bird" made four drop passes, as follows:
1. 1st Pallet - No separation
2. 2nd Pallet - No separation
3. 3rd & 4th Pallets - O.K.
4. 5th Pallet - O.K. 6th Pallet - No separation

After the first pallet "bombed", Mr. Kuhn spoke to the pilot via his ground - to - air radio. The pilot said he would pass the word to the Kicker. When the second pallet also "bombed", Mr. Kuhn again spoke to the pilot, who answered that the Kicker was having trouble cutting the ropes. After the fourth drop pass, 86N came in low for a "look - see". Mr. Kuhn asked if they were going to drop again. The reply was negative - they were returning to Vientiane as the plane was empty. (The question of why 86N wasn't carrying a full ACL has no bearing on this report.).

Mr. Kuhn requested the local leader to inform the people not to disturb the drop until we had examined the sacks. On examination of the three pallets (2 rice, 1 cornmeal) which "bombed", Mr. Kuhn and I concluded that the ropes had not been cut prior to drop. As a result, 80-90% loss. Since the same result would occur of jute sacks "bombed", these three pallets were not considered as part of the test, in so far as the effectiveness of the plastic sacks.

On examination of the remaining three pallets, the conclusions reached by Mr. Kuhn and I were:

1) the plastic sacks, especially those sewn with double

and Quadruple thread, will be Highly suitable for drop purposes.

2) if the sewing is done carefully, single thread will suffice.

3) if a collection system can be worked out, the sacks would have a good rate of re-useability.

Since the test date, this office has spoken with Messers. Camburn, Harold, Sneen, and Knop of the ATOG office. It appears that due to the texture of plastic sacks, palletizing is difficult; that is, if they are roped tightly, to prevent the middle sacks from slipping out, it is difficult to cut the ropes at the door prior to drop. (This raises the question - if the ropes are not cut, why push the pallet out?). ATOG personnel have agreed to attempt to find a more suitable method for tie - down. If this is not feasible, then it will be a matter of finding the optimum tightness when palletizing the plastic sacks for drop.

It should be noted that Mr. Garret, while up - country for the purpose of shooting for National Geographic, had the opportunity to examine a drop. His report, admittedly candid and unprofessional, was that the plastic sacks, "held up very well".

Except for the problem of tie - down as noted above, I believe it can be concluded that the plastic sacks will do what is required - provides a suitable package for air drop of rice, and at the same time, provides the government with substantial savings.

DIST:
USM/PROG
Kuhn/Samthong
Buell AO/Samthong
ATOG - Manager
ATOF/TRAFFIC
RD/RR - 2
C & R - 3

OFFICE MEMORANDUM UNITED STATES GOVERNMENT

TO : Mr. William R. Leonard, ASB 10 October 1972

FROM : MacAlan Thompson, ORA/Logistics

SUBJECT : Rice Dropping

The USAID/Laos, Office of Refugee Affairs, has been in the rice dropping business for about 10 years. At present we are delivering approximately 2500 MT (5.5 million pounds) of foodstuffs per month by freefall drops; this includes rice, canned meat, salt, and PL-480 commodities. Some of the various problems, solutions, and alternatives we have met are as follows:

THEORY:

1. That 40 kg of rice packed inside three each 100 kg capacity jute sacks will survive a free-fall drop with minimal loss and breakage.

2. That this 40 kg triple-sacked unit must impact perpendicular to the ground, i.e., drop vertical for a horizontal DZ or at an angle of about 45° for a DZ sloped at 45°.

PRACTICE:

The process is composed of three basic steps, i.e., 1) rebagging of rice, 2) rigging/palletizing for drop, and 3) dropping. Each step, with some alternatives, will be discussed in turn.

1. Rebagging: Rice is normally delivered to the warehouse in 100 kg net weight jute bags. As our requirement is for 40 kg rice, we have a "services" contract for rebagging the 100 kg single-bag rice into 40 kg triple-bag drop units.

We have two basic prices in this contract, 1) about $24/MT if the contractor furnishes the bagging materials (sacks and string), and 2) about $1.50/MT if the contractor furnishes labor only and the government furnishes the bagging materials. We normally use the $24/MT rate and the contractor has the responsibility, and the attendant problems of buying, shipping, warehousing, and maintaining the materials pipeline for about 1.3 million jute bags each year.

Mr. Wm. R. Leonard, ASB 16 October 1972

We use empty reclaimed jute sacks, 29" x 43", of 100 kg capacity and jute twine for sewing. The cost of the reclaimed jute sack varies from $0.20 - $0.35 each and is presently toward the high end of the range because of the international jute shortage caused by the January '72 Bangledesh war. The twine runs $0.50 - $0.65 per kg; jute bags are usually readily available in SEA as most of the local agricultural products are transported in jute. Certainly if a rice rebagging/drop program is to be set up on short notice, jute bags will probably be the only material on hand.

Starting January '73, we plan to rebag utilizing two polypropelyne bags and one jute bag rather than three jute bags. Still triple-sacked but the cost of Singapore poly bags is only about $0.24 each thereby lowering the cost of the triple-sacket unit from $0.90 to about $0.75 or an annual savings of about $100,000 on the AID/Laos drop volume of 20,000 MT. If this alternative was implemented utilizing U.S. origin poly bags the annual cost would increase by about $150,000.

Here are a few figures for reference:

1 MT rice in 100 kg sacks = 10 sacks
1 MT rice for drop (40 kg sacks) = 25 units
1 MT of 40 kg triple-sacked drop units = 75 jute sacks (25 units x 3 sacks/unit)

Therefore, when bagging 1 MT of 40 kg triple-sacked rice you need a total of 75 each jute sacks of 100 kg capacity, 10 of which contain the 1 MT of rice delivered and 65 of which must be bought empty.

So, into the act of bagging. This sample is based on a 100 MT per day volume as used in Vientiane, Laos. Requirements are 100 MT of rice delivered/packed in 1000 jute bags, approximately 50 kg of jute twine for sewing, and 6,500 reclaimed empty 100 kg capacity jute bags, and about 50-75 laborers. The 100 kg rice is dumped onto the warehouse floor and is then shoveled into the empty bags in approximately 40 kg lots. This 40 kg bag, as yet unsewn and single bagged, is placed on a balance type platform scale and a small quantity of rice is either added from the pile or removed from the bag to bring the bag weight to 40 kg. This single bag is then hand sewn being careful not to tie into the inner bag, and this double bagged unit

The single sewn bag is then upended into a second bag, which is then sewn,

is again upended into the third and last bag for final sewing. This completes the 40 kg net weight triple-bagged drop sack; three jute sacks sewn separately with the middle bag "inverted" so that its hand-sewn seam is opposite the hand-sewn seams of the first and third bags.

To maintain this volume of 100 MT per day we run two production lines utilizing only hand labor. Each line is composed of 1) laborers unloading and emptying the incoming 100 kg rice onto the pile; 2) three laborers shoveling and weighing the 40 kg rice into the first bag; 3) the first of three sewing crews (as each bag is sewn it is passed onto the next crew who add a bag and sew); 4) the stacking/loading crew.

AID/Laos also bags rice, using the same basic system and materials, at two out-stations, Luang Prabang (L-54) and Ban Houei Sai (L-25). The volume at these stations rarely reaches 10 MT per day and can be performed by as few as 10 laborers.

Attachment "1" is a sample copy of a jute bag contract and Attachment "2" is a copy of the alternative polypropelyne bag contract as available from HYTEX (PTE) LTD, 52 Ngee Ann Building, Orchard Road, Singapore 9. Attachment "3"is our current rebagging contract (K 605 per $1.00).

Commodities other than rice can also be airdropped by using this rebagging system. For example, AID/Laos is dropping such rebagged items as PL-480 cornmeal, bulgur wheat, and noodles. We also drop what we call "hash", which is composed of 32 kg rice and 12 each 1-lb cans of meat. Cans suitable for dropping are available in Bangkok and can surely be manufactured elsewhere.

2. Rigging: The second basic phase of rice dropping is palletizing and rigging the 40 kg triple-bagged rice for air drop.

Although rice may be loaded loose (i.e., not palletized) on the floor of an aircraft and then stacked 7-9 bags high in the door for drop, this system is not normally used by AID/Laos, mainly because of safety. There is little emergency jettison capability loading in this manner.

Mr. Wm. R. Leonard, ASB 16 October 1972

The system used here with the C-46, C-7A, and C-123 utilizes a flat wood pallet with two guide rollers and double tracks in the aircraft. The pallet is either plywood or laminated masonite and can be either disposable or not depending on the track system used in the aircraft.

Our earlier model of disposable pallet would probably be most suitable for use in a C-47, depending on availability of either plywood or masonite. It is a 15 mm. thick (about 1/2 inch) and measures 29" x 34". The corners are cut to prevent snagging and holes are drilled to provide tiedowns for the drop rice. (See Attachments 4, 5, 6, and 7). This pallet holds 9 sacks of 40 kg rice.

Six bags of rice are first placed on the pallet, and about an 18 ft. length of rope is laid across the top. Three additional bags are added and are bundled together with a single turn of the rope. The long ends of the rope are then secured to the two side holes of the pallet and tightened. The purpose of tying these three top bags separately and securing them to the pallet is to prevent the pallet from striking the left horizontal stabilizer on the C-46 when the load hits the propblast. To secure the palletized load during ground handling and while in the aircraft before drop, two lengths of rope are tied diagonally across the rice to the four corner holes in the pallet. One only of these ropes is cut before dropping.

In a C-46, this 29" x 34" pallet with guide rollers is used with two sets of double-tracks joined forward of the door by a Y-section which runs into a curved track to the door. The last straight track section extends about 8" outside the aircraft. Seven pallets are loaded on one track and six on the other. Because of cabin width restrictions, a C-47 would probably be restricted to a single double-track and a curved section and would be restricted by ACL to 4.5 to 5 pallets. One loaded pallet weighs about 950 lbs.

The reusable pallet is basically identical except for size. It uses 3/4" plywood, 32" x 48", and holds 18 bags of 40 kg drop rice in two stacks of 9 bags. The main difference is in the tracks on the C-46. The last straight section of double-track that extends outside the aircraft for use with disposable pallets is modified to a tilt section. At the moment of drop, when the loaded pallet is pushed past the balance point of the tilt section, the pallet guide rollers engage flanges that are inserted in the tilt-track guide slot. The loaded pallet tips outside the aircraft, the rice drops off, the

the empty pallet tilts back inside, is slid out of the holding flanges, and the tilt track section is ready for another pallet for the next pass. A sample of this tilt section can be made available to interested parties.

Securing the drop rice to the recoverable pallet is simplified as there is no pallet leaving the plane to strike the stabilizer. One turn of 3/8" manila rope is tied around all 18 bags to prevent "floating" bags in the first 1-2 seconds after drop. Two ropes are tied diagonally across the load to the four corner holes of the pallet. These ropes secure the load during handling and must be cut before drop. An alternative, which cuts down on rope usage, is to use a small rope loop at either end of the pallet and type XIII webbing with two hooks made from 1/4" rebar and a quick fit adapter (AN 6517, MS2204, 48A7053).

NOTE: The rollers used with this reusable pallet are threaded for a nut rather than welded as is the case with the disposable pallet. After 200-300 drops, when the track side of the pallet gets marked and grooved by the tracks, the pallet is turned over, the rollers changed and the pallet good for another 300 drops. See Attachments 8 and 9 for drawings of this pallet and roller.

Another Note: None of the plywood used is of U.S. origin. U.S. plywood was tried and found to be too soft. Bangkok origin, and most commercial plywood in SEA, is made from comparatively hard wood and is not grooved heavily by the tracks.

3. Dropping: The most important consideration in rice dropping is the principle (Law) that the triple-sacked rice bag must impact the ground at an angle of 90°. Any forward motion remaining from the aircraft drop speed when the bag impacts will cause the bag to slide across the ground and rip. This loss is quite evident when observing actual drops as the rice is spread out in a fan from the ripped bag in the direction of drop. In a "normal" broken bag from a 90° impact, the rice will be spilled radially 360°. The only solution to "fan" breakage is to decrease aircraft drop speed or increase drop altitude.

For the C-46, C-7A, and C-123 the drop speed is 100-110 knots at 900-1,000 ft. drop altitude on a horizontal DZ. The drop altitude is correspondingly lower for sloped DZ's as, even though the drop bag will still have some forward speed remaining upon impact, the bag will impact perpendicular to the ground slope.

The simplest drop system does not use tracks or pallets. The drop rice is loaded loose in the aircraft and brought to the door(s) in 7-9 bag lots. The first bag is laid in the door perpendicular to the axis of the aircraft and extends about 12" outside the aircraft. The next 6-8 bags are stacked on top of the first bag but parallel to the axis. At the buzzer, the 2-4 kickers tilt the bags out using the available "ears" of the first drop bag. The main disadvantage of this system is the lack of quick jettison capability in case of an emergency. A modification to this system is to use tracks and pallets except at the door for dropping. If plywood or laminated masonite pallets are at a premium, this mod offers a degree of safety while saving materials.

When using the disposal 29" x 34" pallet with a C-46, two pallets are dropped per pass. The first pallet is pushed flush with the door and the second pallet is butted against the first. Three or four kickers are used, the first pair pushing the pallet in the door and the second pair of kickers handles the second pallet. At the drop buzzer, all kickers push and the pilot assists by tilting the aircraft to the left. Only one of the tie ropes is to be cut. The other tie rope helps prevent "floaters". The drop rice works loose from the second rope before impact (usually). As a C-46 normally carries 13 pallets, this system takes 7 passes to complete the load.

The free fall rice drop system currently in use by AID/Laos utilizes the recoverable plywood pallet and a C-46 with the "tilt-track" mod at the door. Three kickers handle one pallet at a time (18 bags/pallet at 90 lbs/bag). The pallet to be dropped is positioned just short of the balance point of the tilt-track section and, at the buzzer, is pushed forward. Seven passes are required per planeload.

Recommendations for rice dropping by C-47:

1. That the organization establishing the rice drop requirement, assumingly Army/QM, provide the 40 kg triple-sacked drop rice to the Air Force.

2. That the Army, assuming a drop requirement of less than 10-20 MT per day, perform the rebagging operation "in house" and procure the materials, 100 kg capacity empty jute bags and twine, through contract on the open market. If the drop requirement from a single airhead exceeds

30 MT per day, it might be advantagious to explore the possibility of a rebagging services contract.

3. That the Air Force be responsible for the choice and maintenance (procuring) of materials for which ever free fall drop system is chosen, i.e., a)loose sack - loose drop. b) palletized - loose drop; c) disposable pallet drop; or d) recoverable pallet - tilt track drop.

4. That the drop program be initiated using 3b above; palletized loads on tracks for safety but loose stacked for drop. If the program is to carry over any length of time, 3c or 3d should be planned for.

In conclusion, the Office of Refugee Affairs, USAID/Laos, along with various contracting agencies, stands ready to aid any organization with aerial food supply responsibilities.

Distr: RO (2) w/o attachments
ASB "
RMB "

Attachments:

1) Jute sack contract
2) Polypropylene bag contract
3) Rebagging contract
4) Disposable plywood pallet contract
5) Laminated masonite pallet contract
6) Plywood pallet contract
7) Drawing of disposable pallet w/welded roller
8) Drawing of reusable plywood pallet
9) Drawing of reusable threaded guide roller
10) Possible materials suppliers

ORA:MThompson:mhb

Rice Drops

(by Mac Thompson)

Editor's Note: This is a memo written on October 16, 1972 by Mac Thompson about rice dropping in Laos when he was with the Office of Refugee Affairs Logistics section of US AID.

The USAID/Laos, Office of Refugee Affairs, has been in the rice dropping business for about 10 years. At present we are delivering approximately 2500 MT (5.5 million pounds) of foodstuffs per month by freefall drops; this includes rice, canned meat, salt, and PL-480 commodities. Some of the various problems, solutions, and alternatives we have met are as follows:

THEORY

1. That 40 kg of rice packed inside three each 100 kg capacity jute sacks will survive a free-fall drop with minimal loss and breakage.

2. That this 40 kg triple-sacked unit MUST impact perpendicular to the ground, i.e., drop vertical for a horizontal DZ or at an angle of about 45 deg for a DZ sloped at 45 deg.

PRACTICE

The process is composed of three basic steps, i.e., 1) rebagging of rice, 2) rigging/palletizing for drop, and 3) dropping. Each step, with some alternatives, will be discussed in turn.

1. REBAGGING: Rice is normally delivered to the warehouse in 100 kg net weight jute bags. As our requirement is for 40 kg rice, we have a "services" contract for rebagging the 100 kg single-bag rice into 40 kg triple-bag drop units. We have two basic prices in this contract, 1) about $24/MT if the contractor furnishes the bagging materials (sacks and string), and 2) about $1.50 if the contractor furnishes labor only and the government furnishes the bagging materials. We normally use the $24/MT rate and the contractor has the responsibility, and the attendant problems of buying, shipping, warehousing, and maintaining the materials pipeline for about 1.3 million jute bags each year.

We use empty reclaimed jute sacks, 29" x 43", of 100 kg capacity and jute twine for sewing. The cost of the reclaimed jute sack varies from $0.20 - $0.35 each and is presently toward the high end of the range because of the international jute shortage caused by the January '72 Bangladesh war. The twine runs $0.50 - $0.60 per kg. Jute bags are usually readily available in SEA as most of the local agricultural products are transported in jute. Certainly if a rice rebagging/drop program is to be set up on short notice, jute bags will probably be the only material on hand.

Starting January '73, we plan to rebag utilizing two polypropylene bags and one jute bag rather than three jute bags. Still triple-sacked but the cost of Singapore poly bags is only about $0.24 each thereby lowering the cost of the triple-sacked unit from $0.90 to about $0.75, or an annual savings of

about $100,000 on the AID/Laos drop volume of 20,000 MT. If this alternative were implemented utilizing U.S. origin poly bags the annual cost would increase by about $150,000.

Here are a few figures for reference:

1 MT rice in 100 kg sacks = 10 sacks

1 MT rice for drop (40 kg sacks) = 25 units

1 MT of 40 kg triple-sacked drop units = 75 jute sacks (25 units x 3 sacks/unit)

Therefore, when bagging 1 MT of 40 kg triple-sacked rice you need a total of 75 jute sacks of 100 kg capacity, 10 of which contain the 1 MT of rice delivered and 65 of which must be bought empty.

So, into the act of bagging. This sample is based on a 100 MT per day volume as used in Vientiane, Laos. Requirements are 100 MT of rice delivered/packed in 1000 jute bags, approximately 50 kg of jute twine for sewing, and 6,500 reclaimed empty 100 kg capacity jute bags, and about 50-75 laborers. The 100 kg rice is dumped onto the warehouse floor and is then shoveled into the empty bags in approximately 40 kg lots. This 40 kg bag, as yet unsewn and single bagged, is placed on a balance type platform scale and a small quantity of rice is either added from the pile or removed from the bag to bring the weight to 40 kg. This single bag is then hand sewn. The single sewn bag is then upended into a second bag, which is then sewn, being careful not to tie into the inner bag, and this double-bagged unit is again upended into the third and last bag for final sewing. This completes the 40 kg net weight triple-bagged drop sack; three jute sacks sewn separately with the middle bag "inverted" so that its hand-sewn seam is opposite the hand-sewn seams of the first and third bags.

To maintain this volume of 100 MT per day we run two production lines utilizing only hand labor. Each line is composed of 1) laborers unloading and emptying the incoming 100 kg rice onto the pile; 2) three laborers shoveling and weighing the 40 kg rice into the first bag; 3) the first of three sewing crews (as each bag is sewn it is passed onto the next crew who add a bag and sew); 4) the stacking/loading crew. AID/Laos also bags rice, using the same basic system and materials, at two out-stations, Luang Prabang (L-54) and Ban Houei Sai (L-25). The volume at these stations rarely reaches 10 MT per day and can be performed by as few as 10 laborers.

Commodities other than rice can also be airdropped by using this rebagging system. For example, AID/Laos is dropping such rebagged items as PL-480 cornmeal, bulgur wheat, and noodles. We also drop what we call "hash," which is composed of 32 kg rice and 12 each 1-lb cans of meat. Cans suitable for dropping are available in Bangkok and can surely be manufactured elsewhere.

2. RIGGING: The second basic phase of rice dropping is palletizing and rigging the 40 kg triple-bagged rice for air drop. Although rice may be loaded loose (i.e., not palletized) on the floor of an aircraft and then stacked 7-9 bags high in the door for drop, this system is not normally used by AID/Laos, mainly because of safety. There is little emergency jettison capability loading in this manner.

The system used here with the C-46, C-7A, and C-123 utilizes a flat wood pallet with two guide rollers and double tracks in the aircraft. The pallet is either plywood or laminated masonite and can be either disposable or not depending on the track system used in the aircraft.

Our earlier model of disposable pallet would probably be most suitable for use in a C-47, depending on the availability of either plywood or masonite. It is a 15 mm thick (about 1/5 “) and measures 29" x 34". The corners are cut to prevent snagging and holes are drilled to provide tie downs for the drop rice. This pallet holds 9 sacks of 40 kg rice.

Six bags of rice are first placed on the pallet, and about an 18 ft length of rope is laid across the top. Three additional bags are added and are bundled together with a single turn of the rope. The long ends of the rope are then secured to the two side holes of the pallet and tightened. The purpose of tying these three top bags separately and securing them to the pallet is to prevent the pallet from striking the left horizontal stabilizer on the C-46 when the load hits the prop blast. To secure the palletized load during ground handling and while in the aircraft before drop, two lengths of rope are tied diagonally across the rice to the four corner holes in the pallet. One only of these ropes is cut before dropping.

In a C-46, this 29" x 34" pallet with guide rollers is used with two sets of double-tracks joined forward of the door by a Y-section which runs into a curved track to the door. The last straight track section extends about 8" outside the aircraft. Seven pallets are loaded on one track and six on the other. Because of cabin width restrictions, a C-47 would probably be restricted to a single double-track and a curved section and would be restricted by ACL to 4.5 to 5 pallets. One loaded pallet weighs about 950 lbs.

The reusable pallet is basically identical except for size. It uses 3/4" plywood, 32" x 48", and holds 18 bags of 40 kg drop rice in two stacks of 9 bags. The main difference is in the tracks on the C-46. The last straight section of double-track that extends outside the aircraft for use with the disposable pallets is modified to a tilt section. At the moment of drop, when the loaded pallet is pushed past the balance point of the tilt section, the pallet guide rollers engage flanges that are inserted in the tilt-track guide slot. The loaded pallet tips outside the aircraft, the rice drops off, the empty pallet tilts back inside, is slid out of the holding flanges, and the tilt track section is ready for another pallet for the next pass. A sample of this tilt section can be made available to interested parties.

Securing the drop rice to the recoverable pallet is simplified as there is no pallet leaving the plane to strike the stabilizer. One turn of 3/8" manila rope is tied around all 18 bags to prevent “floating” bags in the first 1-2 seconds after drop. Two ropes are tied diagonally across the load to the four corner holes of the pallet. These ropes secure the load during handling and MUST be cut before drop. An alternative, which cuts down on rope usage, is to use a small rope loop at either end of the pallet and type XIII webbing with two hooks made from 1/4" rebar and a quick fit adapter (AN 6517, MS 2204, 48A7058).

NOTE: The rollers used with this reusable pallet are threaded for a nut rather than welded as is the case with the disposable pallet. After 200-300 drops, when the track side of the pallet gets marked and

grooved by the tracks, the pallet is turned over, the rollers changed and the pallet is good for another 300 drops.

Another Note: None of the plywood used is of U.S. origin. U.S. plywood was dried and found to be too soft. Bangkok origin, and most commercial plywood in SEA, is made from comparatively hard wood and is not grooved heavily by the tracks.

3. DROPPING: The most important consideration in rice dropping is the principle (Law) that the triple-sacked rice bag MUST impact the ground at an angle of 90 deg. Any forward motion remaining from the aircraft drop speed when the bag impacts will cause the bag to slide across the ground and rip. This loss is quite evident when observing actual drops as the rice is spread out in a fan from the ripped bag in the direction of drop. In a "normal" broken bag from a 90 deg impact, the rice will be spilled radially 360 deg. This only solution to "fan" breakage is to decrease aircraft drop speed or increase drop altitude.

For the C-46, C-7A, and C-123 the drop speed is 100-110 knots at 900-1,000 ft drop altitude on a horizontal DZ. The drop altitude is correspondingly lower for sloped DZs as, even though the drop bag will still have some forward speed remaining upon impact, the bag will impact perpendicular to the ground slope.

The simplest drop system does not use tracks or pallets. The drop rice is loaded loose in the aircraft and brought to the door(s) in 7-9 bag lots. The first bag is laid in the door perpendicular to the axis of the aircraft and extends about 12" outside the aircraft. The next 6-8 bags are stacked on top of the first bag but parallel to the axis. At the buzzer, the 2-4 kickers tilt the bags out using the available "ears" of the first drop bag. The main disadvantage of this system is the lack of a quick jettison capability in case of an emergency. A modification to this system is to use tracks and pallets except at the door for dropping. If plywood or laminated masonite pallets are at a premium, this modification offers a degree of safety while saving materials.

When using the disposable 29" x 34" pallet with a C-46, two pallets are dropped per pass. The first pallet is pushed flush with the door and the second pallet is butted against the first. Three or four kickers are used, the first pair pushing the pallet in the door and the second pair of kickers handles the second pallet. At the drop buzzer, all kickers push and the pilot assists by tilting the aircraft to the left. Only ONE of the tie ropes is to be cut. The other tie rope helps prevent "floaters." The drop rice works loose from the second rope before impact (usually). As a C-46 normally carries 13 pallets, this system takes 7 passes to complete the load.

The free fall rice drop system currently in use by AID/Laos utilizes the recoverable plywood pallet and a C-46 with the "tilttrack" modification at the door. Three kickers handle one pallet at a time (18 bags/pallet at 90 lbs/bag). The pallet to be dropped is positioned just short of the balance point of the tilttrack section and, at the buzzer, is pushed forward. Seven passes are required per planeload.

Originally Written in 1974

PAPPA HOTEL MIKE TO DROP ZONE ECHO AT LIMA SITE 353

by

Judy Porter

Translation: 8,959 refugees at Ban Pak Ke, in north central Laos, will receive rice from the sky, compliments of the United States Agency for International Development. The end of an era is approaching but it is not quite at hand. For thousands of Laotians and ethnic Hill Tribes people who have been forced to move, time and time again, because of the war, to barren land or land insufficient to support the population; rice from the sky has been the sustaining factor in their rejection of communism.

As of November of 1973, when the first good crop in many seasons was harvested, a substantial percentage of refugees throughout this war torn country became self-sufficient and refugee rolls were reduced considerably. There remain, however, those who fled the intense fighting just prior to the February 1973, cease-fire and the thousands that are crammed into a relatively small area northeast of Vang Viang in the north central part of the country.

The process begins in the Office of Refugee and Rural Affairs at USAID headquarters in Vientiane, Laos. In an office shared with five others, Mac Thompson peers over the top of

the latest reports from his Area Chiefs in the field. The reports tell Mac of the latest influx of people, births, deaths, and other data required to determine the amount of rice and noodles (U.S. Public Law 480) that must be delivered to each village. The map behind Mac's desk looks like a pin cushion. One pin for each Drop Zone. That is easy enough to comprehend. "One drop per month at each Drop Zone?" I asked. "Not exactly" was Mac's modest reply. "A few villages are small enough that one drop a month is all they need but most require several drops and there are some that take 25 or more to feed the population." Mac Thompson is a young man from Portland, Oregon, who appears calm amidst a fantastic amount of detail work. He has worked in Laos for over seven years and is no newcomer to the science of logistics; he once moved several hundred bags of cement into a remote valley by elephant caravan.

Mac's telephone is constantly busy, scheduling and rescheduling with the Operations staff at the airport. During the rainy season the schedule is often disrupted by weather. The dry season is the period of land clearing; slash and burn that engulfs much of the country in a smokey, impenetrable haze. To save time and money, a pilot is given two alternative Drop Zones in case he can't reach his original destination. Rain clouds or smoke and virtually no navigational aids can make it impossible for a pilot to locate a village that is surrounded by high mountain peaks. The alternatives prevent the trip from being a waste but the original village still has to be rescheduled.

The actual number of villages served by Air Drop fluctuates due to the wet and dry

season and the progress of road construction. The network of roads throughout the country has increased tremendously in the past few years, however, many of them become impassable quagmires for several months of each year. Five hundred drops over 99 Drop Zones was the requirement in April of 1971, to feed 150,000 refugees. By January of 1974, all but 46,000 in 43 locations were either self-sufficient or accessible by road.

Each village displays a signal on their Drop Zone: a six foot square letter of the alphabet cut from red or white cloth. Drop Zone Alfa displays an "A." Drop Zone Bravo displays a "B." The alphabet is repeated several times, because of the number of DZ's, but one Drop Zone Echo is Lima Site 353 while another Drop Zone Echo is Lima Site 313. The two Site numbers, or villages, are several miles apart. The Pilot has the Site number on his map. The alphabet signal on the ground gives him a visual check on the correct location.

The rice arrives at the USAID Warehouse at Vientiane's Wattay Airport in 100 kilo jute bags. Here it is emptied and rebagged to 40 kilos in triple bagging to prevent breakage on impact. A C-46, twin engine aircraft, carries an average load of 108 bags consisting of 73 bags of rice and 35 bags of noodles. The bags are evenly distributed on seven pallets that are loaded on rollers inside the aircraft. In-flight they are secured with heavy ropes. The ramp loading crews can reload a C-46 in seven to eight minutes; less time then it takes to refuel. This can be an important factor when five trips per day are scheduled for one aircraft and afternoon rain showers often bring the operation to a halt at midday.

Continental Air Services, with its fleet of Lao Registered C-46's, is presently the principle harvester of the rice paddy in the sky. At the peak of the operation Air America, Inc., was also on contract to USAID for delivery of rice to the refugees from Porter, C-46, and C7A Caribou aircraft.

A C-46 flight crew consists of a Captain, a Co-Pilot and three kickers. The flight from Vientiane to the Drop Zone is usually uneventful. A few minutes before arriving over the Drop Zone tension begins to mount. The kickers bring the first pallet to within a couple of feet of the open door. Some don stocking caps and goggles to protect their eyes from the flying rice kernels and dust; a jacket, depending on the weather and a safety harness around their waist that is attached to a steel cable that runs the length of the aircraft. The Senior kicker watches from the open door, as the Captain circles the Drop Zone, to check the signal on the ground below. The Captain lines up with the DZ at an altitude of approximately 800 feet above the ground. The kickers place their shoulder against the pallet, every muscle tensed ready to spring, and wait for the Captain's signal. A loud BUZZZZZ and out it goes; 600 kilos through the open door falls to the ground below. While two of the kickers ready the next pallet the Senior man watches the bags fall and gives the pilot a thumbs up signal when they land on target.

"The first one or two pallets are kinda guess work" explained Captain Bud Francis of Continental Air Service. "You can't be sure of the wind and a lot depends on the teamwork of the crew in back. If the crew is slow reacting, you buzz early. Same if there's a strong

wind. A lot of compensation is necessary to keep from killing someone on the ground." A slight error could result in 600 kilos falling from 800 feet, landing in the midst of several hundred refugees waiting below for their rations.

The process is repeated seven times; once for each pallet. "I thought the first drop was a little long so I compensated. The second was a little short but still on the DZ. I got the road below lined up in the corner of my window and hit the buzzer." From then on the rice landed at pinpoint on the signal. "I've got a good crew. Fast teamwork makes it a lot safer" said the Captain, whose been flying rice drops for over three years.

As soon as the seventh load hits the ground, the people below make a dash for the bags. There are very few documented accounts of injury or death: an amazing thing considering the vast numbers that wait so near to the Drop Zone.

Some 3,000 refugees have left the guardianship of USAID to settle in no man's land; areas formerly contested but actually claimed by neither the Royal Lao Government or the Pathet Lao. A small percentage but a beginning nevertheless. In the meantime, until the country stabilizes to a degree that more feel it safe to return to their own land, the refugees of Lima Site 353 will be thankful for another load of rice from the sky. End

50-180-7 Laos. Rice from the sky for refugees. The rice arrives at the United States Agency for International Development's warehouse at Vientiane's Wattay Airport in 100 kilo jut bags. Here it is emptied and rebagged to 40 kilos in tripple bagging to prevent breakage on impact. Purpose of rice drops in Laos:- Much of the land is mountainous and accessible only on foot or by helicopter due to lack of landing strips. Thousands of refugees who fled the war further

north are scattered throughout the mountains in temporary settlements. To keep these refugees from starving or possibly decending en masse in Vientiane, the United States Agency for International Development hires Royal Air Lao, and formerly Air America and Continental Air Services, to air drop food to the isolated settlement

50-12

Much of the land is mountainous and accessible only on foot or air. Thousands of refugees who fled the war further north are scattered throughout the mountains in temporary settlements. To keep these refugees from starving or possibly decending en masse in Vientiane, the United States Agency for International Development hires Continental Air Services, and formerly Air America Inc. and, to air drop food to the isolated settlements. Here a Continental Air Service Lao-registered (XW) C-46, call sign Pappa Hotel Mike, is loaded with rice and PL-480 noodles at Vientiane's Wattay Airport.

52-5 Mac

Thompson is assigned to the Office of Refugee and Rural Affairs at the United States Agency for International Development's headquarters at Vientiane, Laos. Mac coordinates the many facets involved in getting rice to thousands of refugees who have been forced to leave their own land because of the war.

51-4

Captain Francis of Continental Air Service at the controls of a C-46 enroute Drop Zone Echo at Lima site 353. Captain Francis has been flying rice drops for over three years and is quite familiar with the terrain. However, there are nearly 100 Drop Zones in a relatively small area, with few distinguishable features, which necessitates cross checking to determine the correct location.

Rice drop 1

Rice drop

2: 51-10 The Senior kicker gives a "thumbs up" signal to the Captain confirming the load

landed on target. The Captain's ability to gauge the wind velocity and the teamwork of his crew is critical. a slight error could result in 600 kilos falling from 800 feet, landing in the midst of several hundred refugees waiting below for their rations.

rice drop 3:

51-11 Interior of a C-46 as the three kickers shove the pallet along the rollers and out the open door, from an altitude of 800 feet, to the ground below. The safety harness around the waist of the kickers is attached to a steel cable that runs the length of the aircraft and ensures the momentum doesn't carry them out with the rice.

Judy's favorite!

END