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REGIONAL AFRICA

HIDES & SKINS, LEATHER AND LEATHER PRODUCTS IMPROVEMENT SCHEME

US/RAF/88/100/11-06B

TECHNICAL REPORT (*)
on a mission to THE SUDAN
17 June-11 July 1992

Based on the work of

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Agro-Based Industries Branch

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Explanatory Notes

1US\$ 95.50 Sudanese pounds (21st June 1992)
1US\$ 99.00 Sudanese pounds (10th July 1992)

Abbreviations

WNT White Nile Tannery
ET Khartoum Tannery
ST Salim Tannery
LDC Hides & Skins, Leather Training and Dev. Centre (Sudan)
DSL Deras Sudan Ltd
WB Wet blue

Abstract

Working under the Regional Project US/RAF/88/100 with the goal towards hides and skins, leather and leather products improvement scheme as Sudan is included in this project, the Machinery Maintenance Expert was sent to visit different tanneries to try to follow the indications of the job description for a period of one month.

The following tanneries were visited: White Nile, Khartoum, and Salim Tanneries and the Hides and Skins, Leather Training and Development Centre.

The assignment given to the expert on this mission was to evaluate the condition of the different machinery in these factories, make spare part lists and if possible to repair or assist by commitment of new machinery.

Main Conclusions

The two biggest tanneries in Sudan, White Nile and Khartoum are at the moment under reconstruction and facing big changes. According to talks with the manager of the White Nile, Mr. Morwan Abdia, this tannery had recently gone under privatization. Most of the new drums and machines acquired some years ago were now installed and the civil works almost finished. Also the old machines were relocated.

On the other hand, their neighbours, the Khartoum tannery was still under reconstruction and it seems that this situation will last at least half a year. It is almost impossible to do some work on hides but they are also well equipped with machinery on site and a lot of the new machines are still in the boxes.

Conclusions

White Nile tannery is ready to start on hides up to wet blue. Khartoum tannery needs 6 more months at least. Deras Sudan will start very soon. Salim tannery will also start soon so that Sudan is a target for activities around hides, skins and leather. A huge potential that could rise and generate one of the highest incomes in forex to the country if it is properly managed.

Recommendations

Sudan itself had a big potential in raw hides and skins (according to different studies, the second biggest livestock in Africa). The two tanneries mentioned above have a well sorted stock of machinery and equipment that easily could allow them to produce 1400 hides a day up to wet blue with no major problems as the machinery is new. What is missing to start on production immediately? the factories are even equipped with new electric generators (at White Nile 375 KVA). the only recommendation is to look for markets, establish quality control and production incentives, train new personnel properly in these areas and start working. After working for some time on hides as well as skins it is possible to work up to 2000 skins a day on each tannery. Efforts should be made to raise production to the full designed capacity of both tanneries.

As the sum of 1400 hides a day is approximately 1/4 of the available hides in one year (1.5 mio from 20.1 mio in 1989/90 according to the "Animal Resources Economic Administration report to FAO), there is still enough raw material to be processed

by Salim tannery and other tanneries (Afro-leathers, Gezira) and any other that wants to work, produce and participate at the development of Sudan.

Introduction

The background information of this project is explained on the job description (see annex 1). The project activity covers various nations but this report covers specifically the activities of the Machinery Expert. The work was done in Sudan and the duration of the assignment was for 24 days.

The original objectives are described on page four (Abstract) of this report and they were not totally reached. As the expert visited the tanneries he found a vast number of machines, mostly from Yugoslavia and purchased through bilateral agreements between both countries. Most of the machinery that was 10 or more years old was installed and connected to the electric system but most of their parts were worn out. The machines could run in some cases but it was impossible to adjust them in order to obtain any action on hide or leather.

The drums, some new ones and some of them still in boxes lying in the yards of the tanneries are of Bulgarian origin. The iron parts are bulky and over dimensioned but we could also say strong and in good condition. The electric components are not made for the hot climate of Sudan and already many of them are damaged. The wood seems to be from good oak trees but apparently it was not seasoned or again the Sudanese climate that is very hot and dry during this time of the year did its work. In order to work with well assembled drums, most of the ones that are installed should be taken into pieces as the planks have to be planed again. The big problem is that now as they are after days of washing with water and filling the gaps with wood chips or leather flays they will work but not last more than four to five years as the chemicals will act between the planks. If they were installed in the proper way, the wood will last 8 to 10 years as the chemicals will act only on the inside area.

Besides the old machines, White Nile and Khartoum are well provided with good and heavy machines for hides production. If the foundation is not properly done and the alignment is not done with the proper level (high quality level for mechanical works and not a level for MASON works), then as the machine is running, the bearings and bushings are going to wear out very rapidly and as with the drums, a machine that is built to last 8 to 10 years is going to be scrap after 3 to 4 years even working three hours a day. Although they were new machines, they have been in the boxes for so long that by installation some hydraulic circuits did not work at all. The pneumatic pistons of the sammying machines on both tanneries were not working and in one case it needed some force to be applied to the piston in order to free it from stop up. with addition of some oil the piston began working without problems.

Besides the two parastatal tanneries, Salim tannery was visited. Although this is a private tannery and running on some production, it was facing similar problems as the two others. Some machines looked like they were in good condition although some of them were not running since several years ago as the right spare parts were missing. They had a stock of spare parts but some of them were not so important or that they would not wear out so fast as others. Many people tried to repair these machines during the last few years but in most cases without results.

As they tried they moved or touched things and parts that were in good condition making them faulty.

If a question is raised where the objectives of this mission were or not attained, we could say that as a split mission of future ones, they were attained as the problem that the tanneries in Sudan are facing is not a single one but a combination of many of them. The expert has now a well defined idea of what can be done and that in order to reach positive objectives the participation of management, government and experts (UNIDO or private ones) is badly needed.

Tanneries Visited

1. White Nile Tannery

The first impression to get while visiting the White Nile Tannery is that after a lot of work has been carried out on it, this tannery is ready to work. It looks like that but if the new management want to prevent heavy break-ups after a short period of working, there are still lots of things to be done before going into production.

The first is to reassemble the drums in a proper way. The work done is reasonable and if the tannery would have a well equipped carpentry workshop, the work could be even better. As the drums have, however, been lying in boxes for so many years in the yards of the tannery, the planks around the sides must be replaced as they are twisted and the gap between them is very big. When this happens, usually people fill them with wood chips, leather flays and other materials which together with water and swelling of the wood will slowly close the gaps and stop the leakage. The problem arises here because during one month of working, the chemicals used for the process of liming or tanning will dilute the filling materials and act not only on the inside surface of the wood but also on both sides that are usually closed tightly together.

Some of the chemicals will leak out continuously and, of course, corrossing the iron parts that tight on the drum. After a few years, (depending on circumstances like the type of chemicals used and the amount of leakage) the drum will be finished. If the drum is properly assembled, it will last 10 to 20 years with small repairs done during this period. It is a pity but the consequences of bad assembling will arise after some years so that initially nobody pays attention to this problem and when it arises, then it is too late and the solution highly expensive. Also the magnetic contractors from electric switches in most of the drum boards are not made for the heavy climate conditions of Sudan during the month of May to July. Most of them, after a short period of time will have to be replaced by stronger ones.

Regarding the machines, they have two types. The first is the group remaining from the first purchases. Specifically White Nile has around 15 machines of this type, mostly for skins (boasting males).

These machines are totally worn out. They could be repaired according to what the new management has decided but this is a matter of evaluation. If the machines are fast enough and their output is from a modern machine to replace, will follow them it is useful to prepare a large and expensive list of spare parts and renew the machines that are worth it. If not, they may be better used to buy four or five new machines then render to the government of the production of another model.

The example is as follows: a new hydraulic fleshing machine for skins should render 320 to 450 skins an hour depending on the working system. If these existing machines are capable of working the same amount an hour then it is much better to repair them as the repair cost may be only one fourth of the price of a new machine. If the machines are slow and rendering only half of the production of a new one, then it is better to buy a new one replacing two old ones.

The second group of machines are new or almost new. These are the machines to work on hides. Two fleshing machines model Turner 350 made by Kostroj. The only problem was that the rubber hose that usually was filled with air from a compressor now on the newest model is filled with hydraulic oil and the hydraulic device was not working properly. The second fleshing has the conventional air system. The splitting machines, one a Rizi model, one of the best splitting machines and as a stand-by a Moenus 2700mm old model but enough for what is going to be produced if the first one fails at a certain moment. For sanmying a through feed hydraulic Kostroj machine was put into work. The felt sleeves were first treated with warm water and the setting out device brought to work as initially the pneumatic piston of it was not working. For drying, the White Nile has, besides two old (Gozzini type) toggle dryers which are in good condition, a new Carlessi toggle dryer, around 80 new glass plates for a pasting but the company which delivered them did wrong tempering and now they brake easily. There are three non-working vacuum-dryers and it is possible to bring one to work and if the demand of finished hides for the local market rises over 250 sides per day, then it would be convenient to repair the other ones or to buy a new one. For skins, the toggle dryer is the right machine but again, there is one new from Carlessi and two Guidalli book case types which have the frames in good condition so that the capacity to dry (assuming that the machines are used in the proper way) is:

Book case types: 20 frames, at least 6 per frame and one batch every 15 min. with 6 workers = 480 pcs. an hour. If the people are working slowly, then every 20 min. a batch. With two shifts of five hours each the production should be 360 skins an hour. The new Carlessi toggle dryer could raise the production to at least 200 more pieces an hour. That would make at least 5600 to 6800 skins up to crust a day. The toggle dryers could be fitted with electric heating if the boiler is not working.

There is a third group of machines which are still in the crates or in the stores. Schaedel type staking machines for finishing skins, 14 new drums for different uses. In fact a collection of machinery that once working will make White Nile one of the best equipped tanneries of the project if the missing ones are purchased.

For finishing, White Nile is well equipped with buffing and dedusting machines. The lay-out of the room where they are installed should be changed as the fans and compressors should be removed from that room because of noise. Also the dedusting machines must be separated by a wall or plates of wood, triply and glasses in order to have them away from the dust generated by the buffing machines.

In the shaving, there are two modern open end 1500mm Rizi machines but it could be possible to repair a former one over 1200mm that is also standing near the others.

For finishing White Nile has 2 Kostroj ironing presses 1200/660mm newly

repaired. One more that could also be repaired and besides other three presses, a new Mostardini through feed ironing and embossing machine. This is the only one being used as it is easier to use as presses. The only problem is that the workers did not pay attention to the instructions to wet the felt sleeve after it had cooled up which made it break in several places and will need to be replaced soon by a new one (see picture).

Apparently the only machine needed is the pigmenting line with drying chambers. A gain a question arises - how many hides and skins are going to be pigmented for finishing? As with the vacuum dryer, it is a question of production. If 15% of wet blue production is going to be finished as a consequence of classification, this will be at the highest production amount 15% of 600 hides. That is 90 hides a day, 180 halves a day. From skins it would be at the highest production rate of 6000 a day, 900 pieces but this will occur may be in a couple of years. A different figure will be obtained if the tannery decides to work more for the local market but all signs are pointing towards export and the local market will have to be shared among all tanneries working on export as finished leathers on local market are mostly made initially from upgraded hides and skins. Besides, this type of tanneries as White Nile and Khartoum are built to work mostly on exports and that is what they should do to be lucrative.

To finalize this evaluation of machines, the last machine on the line is the measuring machine. One of the best one on the market has been installed at White Nile. The Mostardini with computer and stamping device. As there are two other pinwheel machines in the scrap yard it would be advisable to repair at least one of them in order to have it if something goes wrong with the new one. Besides all what has been mentioned, White Nile has a well equipped laboratory, paddles for skins liming, 14 drums not yet installed, an installed line for vegetable tanning with drums, glazing, sammying, ironing machine for sole leather, two new stakers besides one Mollisa etc. and again it is important to mention that the lay-out is a very good one. There is plenty of space, light and the way the production follows is clear and clean.

Khartoum Tannery

This tannery is under reconstruction and the working staff has a difficult assignment to carry on. As the factory is being rebuilt they have to achieve a certain production as well. All the factory is filled with dust from the sand storms and from the civil works. In the mornings some work is done on skins mostly. As the splitting as well as the fleshing machines for hides are in the same room that is being rebuilt there is no possibility of working on hides.

Apart from the dust problems and the civil works which have been done, this factory has, just like the White Nile a big potential on installed machines, machines in crates, machines to be repaired if they buy the right spare parts. Nothing is missing but installation to work easily up to 700 hides a day for wet blue. Excellent Rizzi fleshing and splitting machines apart from a new Kostroj fleshing that was being assembled. Drums as at White Nile in boxes not yet assembled. The same Kostroj through feed sammying machine (but here as air is not installed, the roller that spreads the hides is not working) is working in this factory but again these machines are too narrow for Sudanese hides. They are 2100 mm and should be at least 2400 mm so that shanks are not being pressed.

After sammying a good shaving is needed if the goal is to produce up to crust or

finished leather. A Turner shaver is available but not working for the last 12 years although it is a modern hydraulic machine. Efforts were made to see if it will work again but the pages of the instructions regarding adjustments and hydraulic system were missing as well as spare parts. (Turner England model 482).

Furthermore, two Rizzi shavers are the ones doing the work. One was being repaired as the blade cylinder and motor were taken away. These machines are not so new but in good condition. On the finishing line again lots of toggling and pasting plates (150 of them). Buffing and dedusting machines all in one room with fans, dust collectors, compressors, etc. so that the compressor of the dedusting machines are swallowing the air with dust coming from the buffing machines.

About the drums, the same can be said as of White Nile. the planks are also twisted and if a good assembling has to be done, then the wood planks have to be planed again in order to have a drum that will last long. This factory has over 150 plates for pasting. Two toggle dryers, the bookcase type. In finishing, the factory is better equipped than its neighbour as they have two new through feed Mostardini presses besides one new hydraulic Kostroj plate press and two others not working. they have also two pigmenting lines that need some spares and adjustments but are working. The same new Mostardini through feed measuring machine and a room for cold storage of pickled skins (with new compressors from Rumania). Besides, all what is mentioned, there is a Turner fleshing machine for skins working, some Kostroj not working and five new machines besides the already mentioned in boxes (new from Kostroj). they ar for skins, two for unhairing and one fleshing and for hides, the same as White Nile and may be remainder of some old order, two slocomb type staking machines and also 14 new drums in different sizes. Other different types and makes of machines are distributed all around the factory (BMD, for examples).

As this tannery is being rebuilt it will need at least 6 months if not one and a half years to be fully operational and six months to finish the lime yard. Some drums for tanning are also assembled so that in approximately six months this factory could start producing around 300 hides a day up to wet blue. In this case all the equipment to do this work is new and should not give problems. A different goal is to work on skins or finished leather as in this case a new layout and some new machinery are needed or at least to repair the existing ones after analyzing if it is worth or not or better still buy new ones instead of repairing. Suggestions regarding what can be done are given at the end of this report.

Salin Tannery

General Manager - Mr. Salim Salah

This tannery, a private one and much smaller than the other two is not in a better situation than those ones but at least production is going on every day despite the lack of basic machinery to perform this production.

Mostly it is working on hides and no skins at the moment. It produces around 100 a day. These hides are green coming from the slaughter house. there is no fleshing or splitting done at the fleshing machine is not working. After washing, they are pre-tanned with a small percentage of chrome and then shaved on a 600 mm shaving machine to the final thickness. After this work is done, the hides are then really tanned and the process continues up to finishing. As there is no

drainage to a sewage system, the effluent is stored in a pit at the entrance of the factory and every day pumped into a lorry and taken away to some place in the desert.

The tannery has some machines from Kostroj. The out of order fleshing for hides, a hydraulic press which this expert tried to repair but due to lack of spare parts was not possible to finish, two small shaving machines from Egypt, one Moenus 600 mm not working, one small flesher for skins which is also not working and a very old model and over 60 perforated plates on the roof to dry the hides. Also a setting-out BMD that could be used for skins (also not working). Some small drums for the process are also available. This tannery really needs more assistance than the other mentioned earlier. They need first of all to repair the fleshing machine and to buy any of a splitting machine. Turner model 35-V or 35-VI is recommended urgently. The manager is willing to buy a reconditioned shaving machine 1200 mm working width and this is also important at least to maintain the process as it is now and have some increased production. Also a new soaking and liming drum is needed but there is no place to instal these machines and even if the place was available this factory has first to move because of the limitation due to the effluent. With a higher output they will need to pump the effluent to the lorries the whole day through.

As the tannery has to move out of site if willing to expand, a first possibility to increase production would be to make up to wet blue in other tanneries like White Nile or Khartoum and from wet blue to finish in the place where they are now. After a certain time, they need another place to go as informed by Mr. Salim that they will soon start building a tannery for skins up to wet blue. The best way would be to instal in that place the machinery for working on hides and finish them in the place where they are working now, or better still carry everything to the new tannery.

LDC (Hides and Skins Development Centre of Sudan)

This Leather Centre is very near the White Nile and Khartoum tanneries which makes it very easy for them to do any work needed on hide or leather analysis. They have some tanning machinery, shoe and leathersgoods workshop and a good laboratory. This centre could be the one to establish quality standards (norms) if exports start. They are also capable of training labourers for leathersgoods for the local market.

DSL (Deras Sudan Ltd)

After arriving back to Nairobi our project received the visit of Mr. Nicolae Sfarlea working at Deras Kenya with the Manager of DSL. They explained to us that DSL has obtained a licence to operate outside Khartoum and that the government has planned a common effluent treatment plant for tanneries to be installed at this place.

Main Conclusions

With no doubt, Sudan has one of the biggest potentials on hides and skins in the region and as well as in Africa. On the other hand, the main activities around hides and skins through the last five or more years has been almost exclusively carried out with no value added as dried hides and skins. (With exception of some pickled skins). In case that this system continues, this project has not much to

do as this will mean that there the industrial development around leather is almost nil. Sudan could and should export leather, not raw material and with the installed equipment of some of its factories, they could start immediately.

Recommendations

To White Nile Tannery

Define immediately if new machines are being bought for skins or if the old are going to be repaired. If the old are being repaired, then to proceed as follows:

1. Ask Kostroj for the missing catalogues in English language.
2. Ask for quotation of spare parts and also for quotation of machines from other countries. If the spares are too expensive it could be better to buy a new one than to repair two old ones.
3. Parts like chain and sprockets as lots are needed and should be directly acquired from the maker, for example chains and sprockets, to Renolds, Renolds House, Withen Shawe Manchester M225 WLE, England Telex 669052.
4. Bring an expert to start repairing the machines once the spare parts arrive. It is no use to have the best engineer if parts and instructions are not at hand.
5. Perform some repair works at the existing workshops. Try to promote the development of engineering to work for all the tanneries as a private person or company. If you are paying a third person you can also complain for bad work.
6. Start immediately working on at least 400 hides a day, 75% for export as wet blue and the rest for the local market.
7. While working on wet blue, repair the new assembled drums and plan the protection of higher productions. Start with skins once the machines have been repaired or bought.

To Khartoum Tannery

1. Ask Kostroj for the missing catalogues in English language.
2. Ask for quotation of spare parts and also for quotation of machines from other countries. If the spares are too expensive it could be better to buy a new one than to repair two old ones.
3. Parts like chain and sprockets as lots are needed and should be directly acquired from the maker, for example chains and sprockets, to Renolds,, Renolds House, Withen Shawe Manchester M225 WLE, England Telex 669052.
4. Bring an expert to start repairing the machines once the spare parts arrive. It is no use to have the best engineer if parts and instructions are not at hand.
5. Perform some repair works at the existing workshops. Try to promote the

development of engineering to work for all the tanneries as a private person or company. If you are paying a third person you can also complain for bad work.

5. Try to bring an expert from Bulgaria to commit the compressor for the cold chambers in order to keep on working with pickled skins till the civil works are finished at the hides sector and then start immediately producing wet blue for export as White Nile Tannery.

To LDC

1. Suggest to the authorities on how quality controls could be performed and offer a guarantee test to export material.

To Salim Tannery

1. As long as a fleshing machine, a splitting machine and a good shaving machine are missing Salim tannery is trapped in a dead end. If it is only possible to produce more within the mentioned machines as there is no way to discharge effluent liquors, the production could not be raised. The best thing for Salim tannery would be to buy wet blue hides from other Sudanese tanneries till the new plant is operational. Meanwhile, repair the press, the fleshing and the setting out machines. All the water workshop could be done (hides and skins) afterwards at the new tannery when this starts working and the finishing could be carried and done at the plant in Khartoum as the effluent liquors would only be from retanning.

To UNIDO

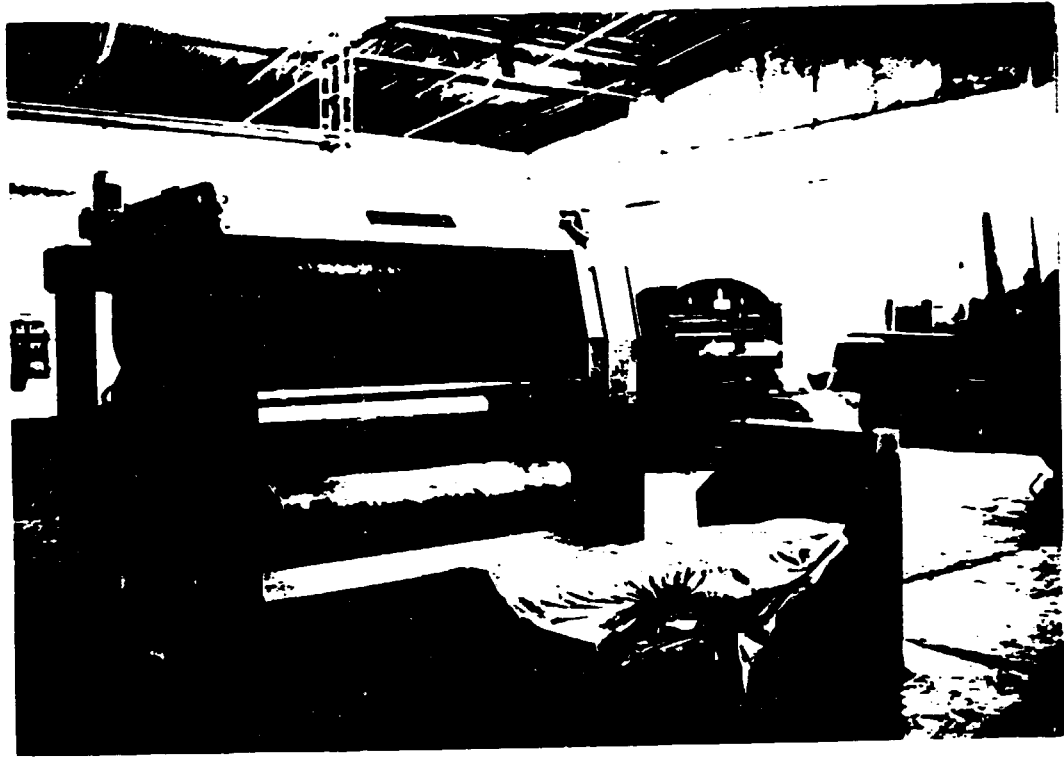
1. At this moment, Sudan needs to define whether its industries are going to work or not at full capacity with wet blue or crust exports. They have most of machinery needed to do that. Sudan needs at the moment the advice of experts to request for spare parts, repair machines, improve tanning, develop export policies in wet blue. Once this is working, the possibility arises to start developing a good shoe industry for export. The geographic situation makes it easy to reach arabic countries and Europe with a good shoe quality. This depends only on how leather industry develops.

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SWEDISH ASSEMBLING a DECK at L. HÄRTEN T.

ANNEX 2

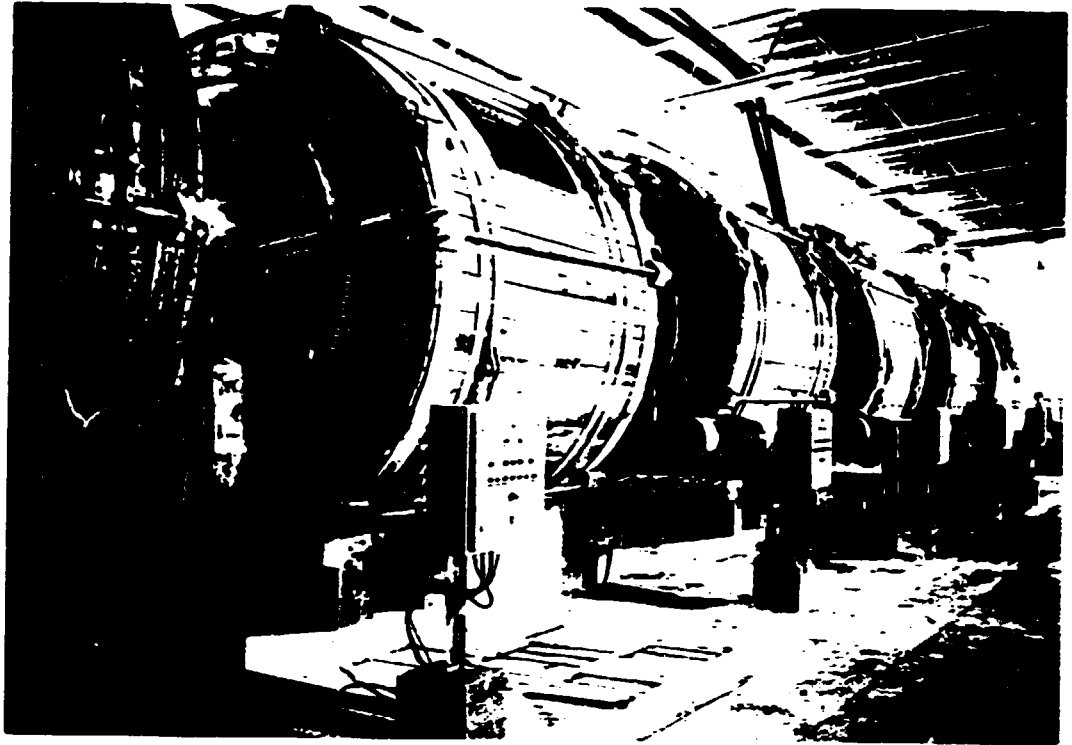


SUDAN UNIT



Most of machines not operational

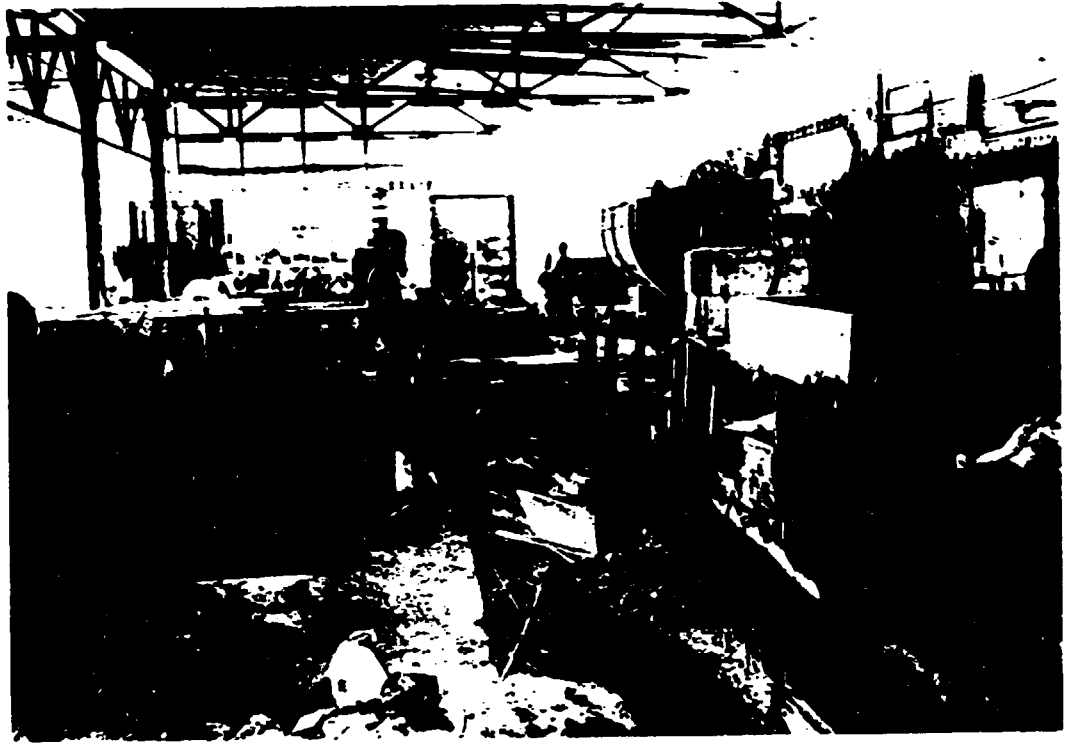
ANNEX 3



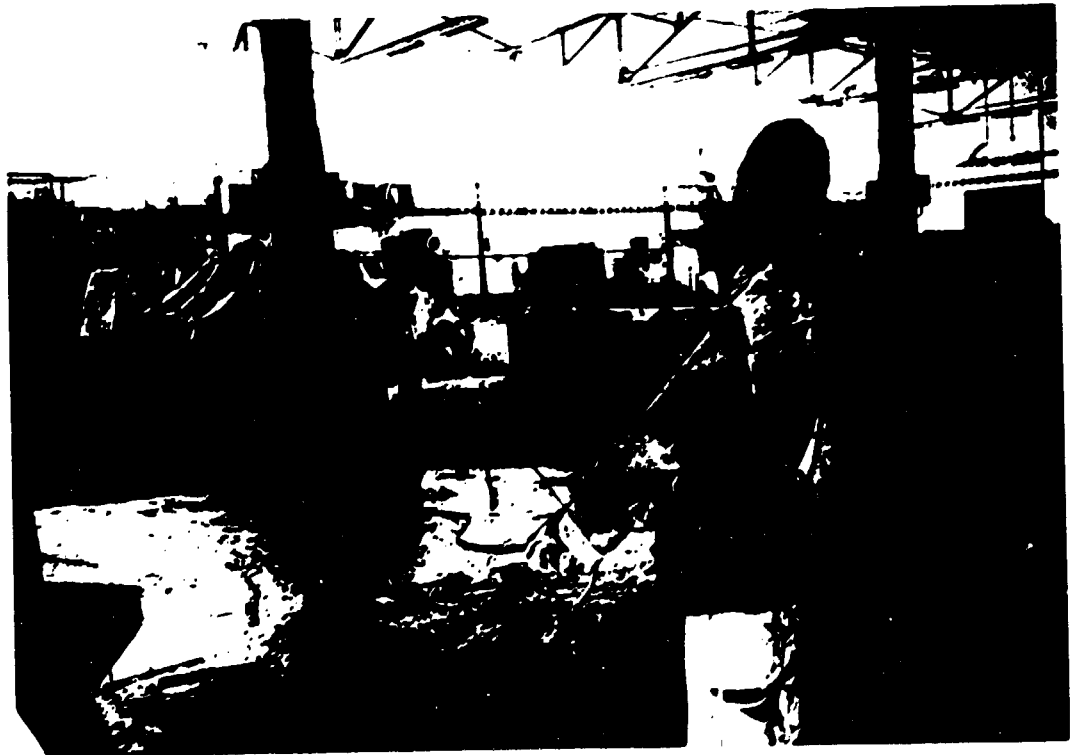
Sudden WNT



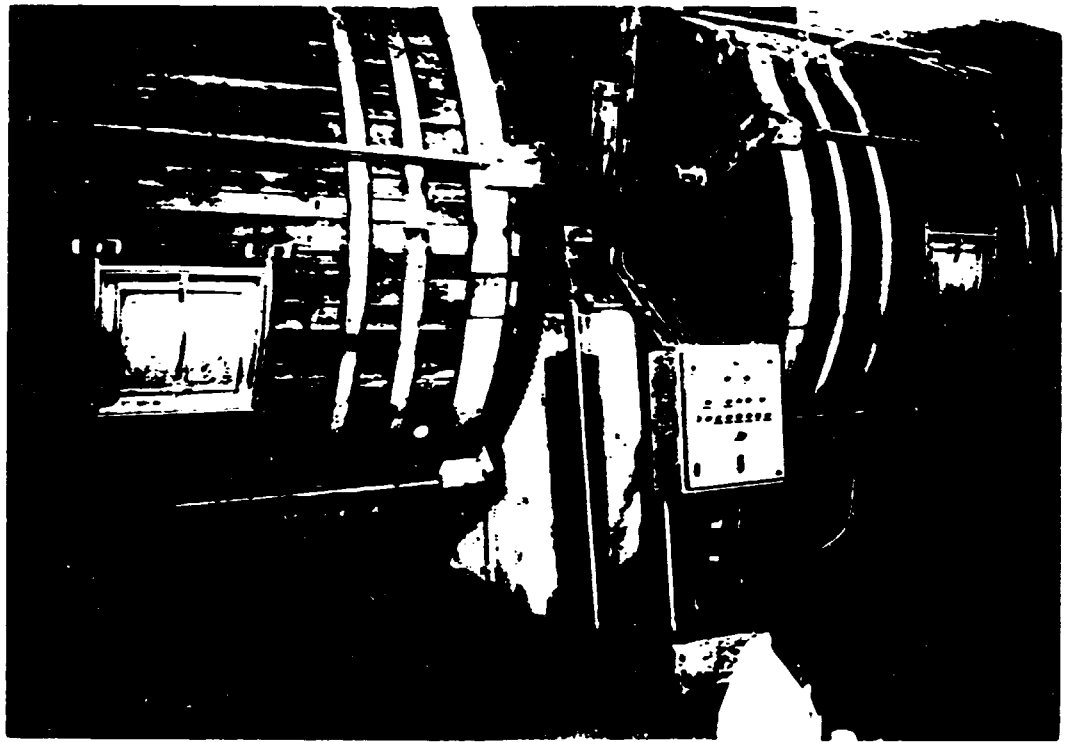
ANNEX 4



Süden LEHARTOLM TAVIRIY



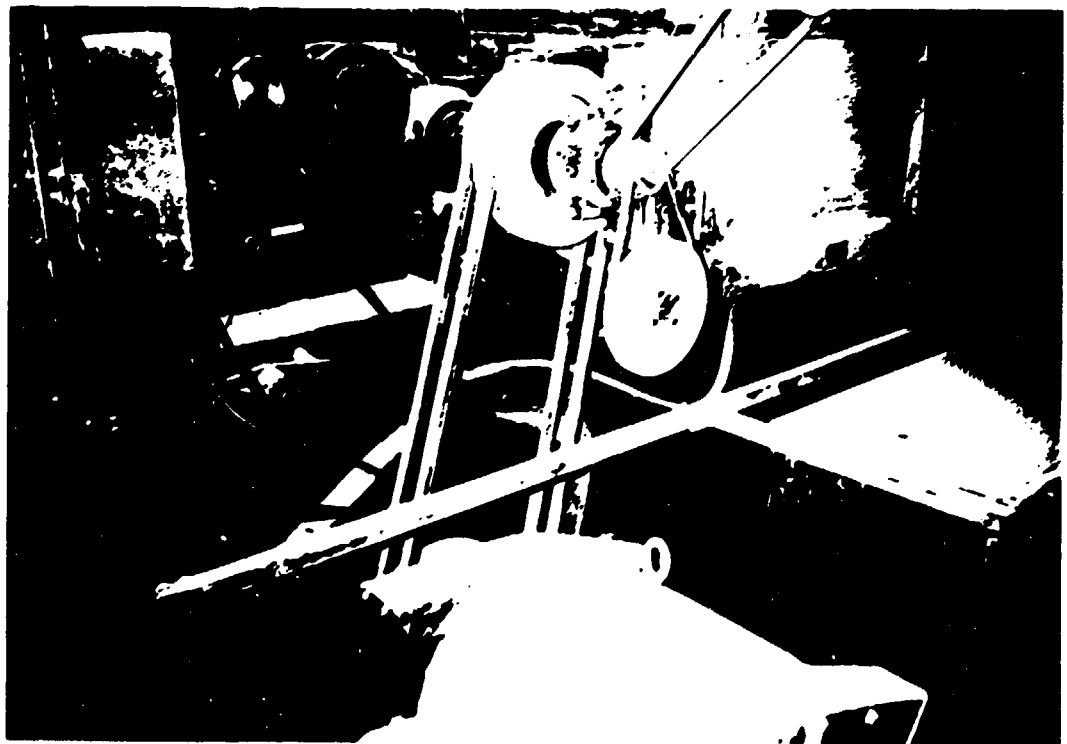
ANNEX 5



DRUMS

50 DUM

LABORATORY TANKERY



TURRET SHAVING MACHINE

JAN 6



SUN 2DC

