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ETHIOPIA

Mission Report

Regional Hides and Skins, leather and leather products improvement scheme

Us/RAF/88/100

From 02 - 30 Sept. 1989

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MACHINERY MAINTENANCE EXPERT 11-06

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PURPOSE OF VISIT

To visit five of the tanneries, connected to the NLSC, the National Leather & Shoe Corporation, and give technical assistance and comments on their maintenance control.

WORK PLAN

The work plan was prepared prior to the arrival, by the national expert, Mr. Seyoum Hailu, and consisted of an introduction visit to the technical department of the NLSC, and to the five tannaries. Then, later to return to the tanneries for a working visit.

LIMITATIONS

The time in Ethiopia, 28 days total, proved to be very short considering the number of tannaries to be visited. This explains for limited practical works which was enabled.

TANNERIES TO BE VISITED

Addis Tannery, located 5 - 6 km from town centre.
Ethiopian Pickling and Tannery Factory, located 4 km from town centre.
Awash Tannery, located 4 km from town centre.
Ethiopian Tannery, located 90 km from town centre.
Modjo Tannery, located 75 km from town centre.

Capacity of the tanneries, figures from NLSC 88-89.
Hides - Approx 4200 pieces per day
Skins - sheep/goat approx 45000 per day

NUMBER OF EMPLOYEES

These tannaries employ close to 3000 workers, included approx 330 maintenance members (all included).

GENERAL FINDINGS

There are a few things general for all the tanneries visited. The NLSC has with UNIDO assistance during the past build up a preventive maintenance system. This system is now incorporated in all the tanneries and also the shoe and leather goods factory, all connected to the corporation.

The system is build around inspections, small repairs, medium repairs and overhaul.

The intervals in between each categories is set by experience and partly by the complexity of the machines. The complexity factor also comes in for the time set for the individual aspect. To make this work every machine has its number, identity, and its own history file.
The only machines excluded from this system is the "long lasting" machines, i.e. parralell plated embossing machines. This type of machines comes under brake down maintenance.

Thsi system should be fully capable of giving the inspectors the intervals and the background for each machine to be inspected, especially as it also includes an inspection list prepared for each type of machine.

With all this in mind, it is sad to observe and to find so many errors. Wrong adjusted machines and machines with technical problems and, the worst, a lot of machines very dirty, badly greased and showing other signs of negligence.

Another general problem for the tanneries, that do hides, is thickness. Splitting and shaving. At the moment the three tanneries doing hides, Addis Tannery, Awash Tannery and Ethiopian Tannery are all having problems connected to these two operations. This inspite that for Addis Tannery and Awash Tannery the splitting is at wet blue state, but as for Ethiopian Tannery, it is at the timed state. The only difference is that those who split in wet blue has a higher split recovery than the one that split in time. In both cases the splitting is uneven to an degree of giving the shaving to much to remove.

The last general problem is effluent. None of the tanneries visited has a effluent system in operation. This in spite that for one, Ethiopian tannery, the effluent system is already build, and for one other, Modjo tannery, the equipment for the effluent system has been on stock for the last four years.

ADDIS TANNERY

The Addis Tannery with its 65 years is Ethiopias oldest tannery. It is located 5-6 km from Addis Ababa, at the end of a road which is in such a condition that ordinary cars just about can make it. The location of the tannery is at the bottom of a narrow valley, with one river going at the back side of the buildings,and another almost parting the actual tannery from the boilers, workshops and office building.

Three weeks prior to the arrival this last river suddenly increased and almost totally flooded the tannery. The water level in the factory was 60-80 cm, on the floor. The water carrying a lot of mud, did a lot of damage to the leather, also carrying some of it away, and also completely soaked every electric motor under the given levels.

This is not the only natural problem the location have. Located in the bottom of the valley it is also threatened by landslides. A few years back a landslide destroyed half the limeyard. This treat is by no means over, as one could see a very recent one almost touching the road in its final bend.

The capacity of the tannery is about 750 hides per day. This is partly processed to wet blue, crust and finished leather. The finished leather is mainly for army purposes. The wet blue and the crust is both very dirty, partly because of the flood and partly because the water treatment of the muddy river is insufficient.

SOAKING LIMING

Soaking in four pits. Liming in paddles, temporary out of function due to the flood, but shall in all cases be transferred into drums. So at the moment liming is taking place in three second hand drums and one new 3 x 3.25 m drum.

FLESHING

A combination of green and lime fleshing. In both cases done on sides. For green fleshing an old Svit machine, for lime a two - three year old Aletti fleshing machine. The fleshing is generally bad in both cases. This is mainly due to the fact that there is no selection into weight classes before fleshing, but also that the operators is not taken proper care to see that the entire skin is fleshed before reopening the machine.

TANNING

Tanning is taking place in three Vallero 3 x 3 m drums. This is at present sufficient for the todays approx. 9 tons. All drums have some door leaks, and there are very few hoopes on the drums, only 8 hoopes per drum. There are no compressed air available so therefore the brakes are not operating. This causes a lot of strain on the gearboxes, which in respect, for two of the drums

not any longer were properly anchored. There is no water meter for the drums.

SAMMYING

There are two sammying machines. One old Svit machine, temporarily out of function due to the flood. This is an 1800 mm working with machine. The other machine is a Mercier machine, 3000 mm working with and thereby originally designed to same whole hides sideways. Since they sam side sideways, they don't achieve a very good result. The machine has a major slack in the main bolt for the top arms carrying the top pressure roller. Considering the age of the machine, approx. 5 years, this is very soon, especially since it once already has been repaired. This indicates lack of greasing or some other mistakes. The output from the machine is small, two sides per minute, which at the present stage leaves them to do two shifts.

SPLITTING

Chrome splitting on two machines. One, a Moenus splitting machine is generally not in a very bad condition. When the result still is bad it is by the fact that the skins arrives creased, some minor adjustments and that the operators tenders to either lift the bridge or lower the rubber roller to ease of feeding the skin. Also some problem occurs because they do not frequently enough bring the table back to remove pieces of leather stuck to the segment roller and the segment guide.

The other, an old mechanical turner splitting machine is in a bad condition. The machine has a number of faults and needs basically a total overhaul if it is to be considered further use.

They still work on it, but it does basically more damage than acceptable work so it should not be used.

SHAVING

Three machines. One Scit flat tabled, mainly used for splits. The machine does not hold the split which leaves to the operator a task they do not cope with. A lot of damage. No thickness control with measurements except fingers. The machine has a vibration and the grinding is very bad.

One Aletti, approx. 5-6 years old. Fully hydraulically machine. Some vibration, urbalanced cylinder and also grinding wheel. The covers for the support saddle of the grinder keeps coming loose and blocks by this the grinder movement. According to history card of the machine this is a common problem, which in spite of countless repairs, keeps on reappearing.

The results from the machine is better that one would expect in light of these informations. There ofcourse is chatter but less than one should think. As for the Svit machine, not thickness control except by feel.

One old narrow Turner machine. The type rebuilt to have hydraulic closing and hydraulic traversing of grinder. This machine was the one that we worked on. By the time Addis tannery's time was out, the motors still had not reappeared from the electrical shop where they had been taken for drying, cleaning and changing of bearings. How the machine worked, is by this reason unknown.

TRIMMING (Wet)

After shaving the skins were literary thrown in a heap, to be later placed on tables for trimming. The trimmers used razor blades (for beard) rapped in cloth and tape, as knives. This could be some of the reason while the trimming is very hard. When you are in danger of cutting your fingers you tend to take a bigger piece of leather than normally would be necessary.

RETANNING

Retanning drums, two Vallero 3 x 3 m. Working speed 8 to 12 Rpm. Minor oil leaks on gearboxes. All door locks needs replacement. As for tanning drums, very few hopes. There is no tempered water, and no water meters. For the last drum there is a severe misalignment between the gearbox and the drum. This has happened during the foundation building, as the same misalignment occurs from the drum foundation to the gearbox foundation. This must be rectified or else is the big crown wheel on the drum going to be destroyed.

SETTING MACHINE

An old Svit plain setting machine. There is no dewatering except piling before setting. This makes the setting very bad as the skins are much to wet for a plain setter. The fact that they also, unknown by which reason, puts two sides on top of each other in the machines, more or less explain the bad result. The machine speed is also to high.

DRYING

Three means. A Gozzini doublematic vacuum dryer. Has a lot of minor leaks, a vacuum reading of 45-50 cm Hg and has due to the boilers a very variable temperature. The machine is as the leather, very dirty. These facts, and mainly the temperature and the low vacuum reading, gives a very poor result. There is hardly any evaporation.

Heating plates. Three tables all connected directly to boilers. The sides are slicked on the plates and removed when they have dried for a while.

Hangdrying from the roof. Two holes are made in the butt. A piece of wood is put through the holes and the skin are hanged on hooks attached to the pin.

STAKING

Three very old slocum stakers. Belt driven from central motor. Are all in a bad condition and needs if still continued work is wanted, to be overhauled. Leather band is missing for all which also makes them difficult to operate.

CONDITIONING

Non existing.

BUFFING

One Aletti and one Fulminosa. The Aletti had its motor soaked and also the underlay paper was destroyed, by the increased humidity under the flood. The Fulminosa operated without bigger problems.

DEDUSTING

Rizzi airblast. Is not doing a good enough work so there is a repeated operation on an old turner rotary brush machine.

PADDING

Handpadding. Also includes hand application of dye. After padding carried to drying on poles. No air heating. The dye solvent, betylacetat, is very present.

SPRAYING

Hand spraying. The compressor for the spraying is placed close to the spray places. It has no pressure reducer and there is not any dewatering system. Drying after spraying in chamber heated, though not very much with small floor ovens.

EMBOSSING

Two Svit embossing machine. Two different sizes, and the smaller placed to far away. Beyond this there is no problems.

MEASURING

Two machines. One Selin, an electronically operated machine. This machine was soaked quite heavy under the flood. They claimed it to function, but did not use it since the absence of compressed air leaves out the stamping function.
One Turner pinwheel machine. Also soaked under the flood but did not seem to have taken any damage. Was in use.

OTHER EQUIPMENT

Due to the narrow buildings and the uneven floor at several levels, the internal transport is, for wet blue on heavy carriages,

for crust and finished, on horses and flat trolleys. There is a lot of dirt and damage on both levels due to tilting and slipping. There is one curtain coating machine which has been out of function for more than a year because the pump is destroyed. New pump is on order.

Boilers. Two old wood fired boilers. No pressure gauges and the situation can only be described as dangerous.

Workshops. Very small and equipt with machines of low quality and low accuracy. The access to the work shop is difficult for bringing in things for repairs.

EFFLUENT SYSTEM

Non existent. All waste water goes direct to river. This also includes all solids, such as flashings, trimmings, nonuseable splits and shavings.

RECOMMENDATION

The tannery and in particular the buildings is in a bad condition. The location bearing in mind the flood risk, danger of land slide and the fact that there is no space for any expansion in most unsuitable. This also includes that there is not possible to build any kind of effluent treatment.

In the light of these facts, the best would be if the tannery could be moved to another place. if there could be found ground area within reasonable distance, the workers could remain and the present area could be used, the better part of it, to build an effluent treatment system on.

The cast of such an operation should in any case be put up against the cost of rehabilitation of the present factory. There can be little doubt that a rehabilitation would mean building almost an entire new factory, and one would still be stuck be the natural problems as flood and landslides.

As a matter of safety, the boilers should in any case be equipt with pressure gauges, and if possible be equipt with safety valves.

ETHIOPIAN PICKLING & TANNING FACTORY

Located 4 - 5 Km from Addis Ababa. The factory is at present pickling and wet blue tanning sheep and goat skins at a rate of 8000-8500 per day. The amount of wet blue-pickled various as the upper gradings is pickled and the lower gradings chromed. The NLSC is preparing a rehabilitation program for the factory, including a further expansion into crust.

The present working staff is 250 workers including II maintenance members.

SOAKING

Soaking is done in paddles, 8 paddles which each has a capacity of 1500 skin.

PAINTING

One painting line. Hair removal by hand rubbing.

LIMING

8 drums. Mostly Olcina but also some Vallero drums. Same measurements 3 x 3.25 m. The drums work at 4 Rpm.No water meters.

PICKLING/CHROMING

8 drums. Olcina/ Vallero, measurements 3 x 3.25 m. Capacity per drum said to be 2500 pieces.

All drums, liming, pickling and chroming suffers from smaller door leaks. Some has oil leaks gearbox. Generally bad cleaning. In the process they include hand scudding.

FLESHING MACHINES

Three machines. One old, approx. 15 years, Gozzini fleshing machine, working with 1500 mm.

This machine is a bit weak, has slack in cranks for closing mechanism and tends to bend on heavy skins. The machine is to be replaced.

A Rizzi 1500 mm working with Approx. 10 years old. Has a heavy slack in main bushes/pins for support feed roller. Grinder fixture is damaged and one brass strip is missing or totally worn out. Chain for grinder traversing is broken. Blade cylinder has heavy damage on blades right side. It is so far out that it only affect heavy skins. The damage must have happened during transport after reblading or by mounting in the machine.

Rubber roller has reduced diameter right side. A Aletti 1500 mm working with 3 years old. This is the most modern machine. It is also the one machine which is most sensitive towards mishandling. The electrical foot switch is broken down, most of the electromagnetic valves has been changed, in such a way that all wires and connections is more or less damaged and needs overhaul. There are heavy slack in frame and support arms for feed roller. This is caused by insufficient or no greasing.

The pins we tried to rebuild to reduce the slack, but in the absence of spares and bad machining, it only became a 50% quality repair.

All the machines are very badly cleaned and also greased work shop/mechanical, electrical.
Almost as non existing. The tools, a grinder and a drill is both of a quality hardly sufficient to do anything. Both workshop is in a big mess. Has to be rebuild totally. Spares is almost non existing.

MAINTENANCE SYSTEM

In spite of the condition of the machines the annual preventive maintenance system is prepared to every detail.

EFFLUENT SYSTEM

For water to be used in the factory there is a settling tank. For waste water there has been some pits mainly for airration but this was not in operation. There is available space for effluent treatment but this matter will be touched later as a separate subject under general recommendations. (Page 30)

RECOMMENDATIONS

The Ethiopian Pickling & Tanning Factory needs to make an effort into making the already established preventive maintenance system, to move from only paper and into reality. This means that the workshops needs rebuilding, there must be established some spare part system and the most important, the quality and attitude from the maintenance members must be uplifted.

If the present situation continues, and the factory installs more machines to move to crust as planned, these new machines will last only a short period of time.

The two fleshing machines which not is to be replaced, the Rizzi and the Gozzini should both be taken for a overhaul while there still is something to overhaul.

The ways of doing such an operation will be listed under general recommendations. (Page 30) 2,5

AWASH TANNERY

Located very close to the EP&TF, but slightly down the river so 4 - 5 km from Addis Ababa.

As one of the oldest and biggest tanneries in Ethiopia Awash is producing both skin, sheep/goat semi processed and hides. The hides is partly done finished.There present capacity is approximately 10000 skins and 850 hides per day.

They employ 800 workers including 72 maintenance. These 72 includes mechanics, electricians, wood workers and inspectors. As for the other tanneries within the NLSC Awash has a good theoretical maintenance system. As also for the other tanneries the quantity of errors and wrong adjustments is to high.

In the history card one also finds some error or some repair done over and over again.

Main purpose of visit is to check effects and quality of maintenance system and to maintain a turner chrome splitter. Workshop mechanical work has reasonable equipment but none to high quality standard. It is a bit unpractical being spread over more than one room.

Wood workshop is well equipt and they make a lot of their own things. Several smaller home build drums indicates high quality work. They will also if high quality wood could be provided try to build drums in 3 x 3 m sizes.

DRUMS

Most of the drums for both liming, tanning and retanning are Olcina drums. Particularly the soaking liming section made a very good impression. The oldest drums are 8 - 9 years but good cleaning and lubricating of bearings, bushes and door slides and locks, proves what can be achieved when one takes proper care of the equipment.

FLESHING

The fleshing is done on sides and is to variable. When the grading into weight classes is missing or done improper the fleshing suffers. This is mentioned because it comes back as a big problem at a later stage.

TANNING

There is no water meter for the drums. When the drum is emptied, the sides is more or less thrown in a pile awaiting the following days sammying. Because of this bad piling and also the delay, the skins inparticular in the lower lays of the pile gets very heavy creased.

SAMMYING

A through feed Aletti machine. The machine problems is mainly that the rubber coating of the pressure roller comes of in bits. This eventually gives patches with improper sammying, but it also

destroys the felt bands. For a country like Ethiopia, in which it is not possible to have a rerubbering made it is also very expensive from that point of view.

Since it is a machine designed for whole hides and at present used in sides, already heavy creased, the result from the machine is very bad. It does not help that by capacity reasons they are forced to run two sides at the same time, next to each other. This gives big difficulties in using the spreader cylinder, which as a consequence in most cases are not used.

SPLITTING

After sammying the sides is left so long before splitting that the above mentioned creases dries out. This explains for some of the problems in splitting and also explain most of the damage done. Some of the other problems in splitting comes from the inadequate fleshing. Since some of the sides are very "raggy" on the fleshed side to much of this comes of and clogs up the segment roller and keeps it from operating properly.

The history card for the splitting machine tells that the machine had a check last 7 months back. Since then there has been inspections. The last inspection stated, dust on collector and bad shape of a grinding wheel. The real condition of the machine is a totally different picture.

The machine is a Turner 1800 mm working width built in 1980 as a conventional chrome splitter. The check of the machine produced the following list of worn out parts and wrong adjustments. The substance roller (feed roller) was heavy damaged due to the wrong adjustment of the left magnet. The

magnet had been touching the substance roller and both should be replaced. The nose stips on both back and forward covers was worn out, allowing the substance roller to move with the side. The bearings for the substance roller was worn totally out. The support rollers were wrong adjusted. The support nose (edge) of the table was hollow with about 6 mm. The segment roller was wrong adjusted and as stiff as solid.

The ring guide was wrong adjusted, allowing the segment roller to climb. The jaws was totally worn out and gave variations from 0,1 - 0,4 mm. They were also cracked.
And finally, the level of the blade was set for dry splitting and not for chrome splitting.
To restore this machine most of the above mentioned items would have to be changed. While checking the store, only about 50% of the spares was available. To avoid destroying those parts by running against worn out parts it was decided to set up the machine with only the old parts, and read just as good as possible.
After this work was completed and the machine was back in operation, a simple test, while a good side was selected, all the heavy creases was trimmed away was done. the result of the side and the split was not as good as one would have liked it but acceptable. The average splitting however, was not as good due to above mentioned reasons.

As Awash tannery in the near future will shift from chrome to lime splitting there was a wish to rebuild the splitting machine to be capable of do lime splitting. This is not a good idea. The

machine will not last as a lime splitter and being only 1800 mm wide nor will it be capable of splitting whole hides. Considering a whole hide sammying machine, to lime split sides can not be recommended.

SHAVING

Two Aletti machines and one Rizzi machine. Only the two Aletti machines were in operation, during the visit. In both machines there was made a lot of damage. Partly because of to high working speed and partly because of the damage already done. The fact that they also tend to split to a too big distance from desired shaving thickness forces them to shave twice, which also contributes in destruction.

QUALITY OF WORK

As already mentioned there are made to many errors on various stages in the process which all in their way contributes to destruction of leather. The amount of trimming needed to remove all the errors results in to many trimmings and end leaving the sides almost shapeless.

EFFLUENT SYSTEM

Non existent. It is disappointing to find that a tannery this size have no effluent system. Before, when the tannery was privately owned there was build an effluent treatment system according to the size of the factory at the time. Since then, the capacity has increased and as the effluent system was to small to treat all the water no nothing is treated.

For the water coming to the factory there is two tanks to separate solids from the polluted river.

INSPECTION

As one of the findings in Awash is that there is a gap between stated condition and real condition there was set up an inspection of a shaving machine to check what happened during an inspection. From other inspection reports one can read that the time actually used on inspection, as good as always was much lower than the given time for inspection. To enlighten this the splitting machine can be taken as example. According to the plan the inspection should take more than two hours. Actually spend time was 25 minutes. Bearing this in mind, the inspection of the shaving machine started. The inspection was performed by one mechanical inspector and one electrical inspector.
The result was totally different from other inspection. Carrying the check list the inspectors covered everything and missed out only the few points that was not mentioned on the list.

To their defence can be added that the things they missed out, only better basic knowledge and more experience can help out. This indicates that with better knowledge, more experience and a improved attitude towards work much will be achieved.

RECOMMENDATIONS

Awash is generally doing a good job, but as one will have observed there are a few things which needs improvement. The education of maintenance member must be better. The quality of the preventive maintenance program does not reflect in the condition of the machines. The errors made in production must be removed to increase the yield. This includes human errors in terms of bad training, negiactance and also that routines which

today causes problem must be changed so to avoid or at least reduce the side effects.

The tannery will have to realise that effluent treatment must come sooner or later and that the step in one good direction can be to seek possibilities to reduce the water volume. Not all water coming from a tannery necessarily needs effluent treatment.

ETHIOPIAN TANNERY

Ethiopian Tannery is located 90 km from Addis Ababa and is the biggest and most modern tannery in Ethiopia. At present they employ 1000 workers including 101 maintenance members. (figures from NLSC 88/89). They have a present capacity of 10,000 skins, sheep/goat and 1,200 hides per day.

The NLSC is running a rehabilitation programme in the tannery which consists of rebuilding soaking/ liming for both skins and hides and will when it is completed early next year increase the capacity to 1,500 hides and 14,000 skins per day. The tannery was built 15 years ago with assistance from Czechoslovakia. Most of the machines are consequently Svit machines. The tannery is the only, so far, in the corporation which does lime splitting. According to the production heads, the split recovery for the new machine, is between 5-10% from the higher weight class.

The Ethiopian tannery is about to receive four overhead dryers, two for sides and two for skins. They are also on their own, rebuilding the total three old pasting units from pasting to frame toggling. The factory has a very nice set up with factory buildings stores service arrangements and everything in separate buildings.

HIDE SECTION

Soaking in four new paddles. All lifted from the floor with gallery in behind.

LIMING

12 new drums.. All set up in lines to the side walls allowing floor space for forklift handling and with gallery on the back.

Fleshing on 3 Svit machines. One already built up on platform, the others to follow. Since this tannery selects the dried hides in weight classes the flashing is more even. Only the green ones go in one lot of practical reasons.

SPLITTING

One Mercier machine for hides. Only one year old but from a mechanical point of view the machine is already to show signs of minor problems. This emphasised by the result which is uneven splitting. Still this machines gives a split recovery on crupons from 5-10% on the heavies. The Svit machine has no split recovery at all, and the splitting is very inaccurate.

TANNING

10 belts pulled tanning drum. They have a very wide inside door which in addition to bad wood quality weakens the drums. The drums are as a next step in the rehabilitation programme going to be replaced. Two drums at the same size is for sole leather.

SAMMYING

On a one and a half year old Rizzi through feed machine. Since the hides come direct from tanning, and are sammed whole this

machine gives a good result. The operators are also good at preparing the hides on the felt. The machine has however, been running the same felts since installation and they are overdue for changing.

SHAVING

One almost new Rizzi RLA 10 machine and one a few years old Aletti. Then 5 flat tabled old Svit machines. The Svit machines are not much in use, so the two others take the load. Apart from some chatter it is not bad, especially considered that they remove 1-1.2 mm as a result of the uneven lime splitting. They also shave twice as the amount is so high, but due to good sammying the damage is reduced.

RETANNING

12 retanning drums. All the same shape and size and with inside sliding doors. No water meter.

SAMMYING

Three narrow conventional sammers. All Svit works all right.

SETTING

Three plain Svit setting machines. Operates very fast. Could look as if almost over doing but that was the way they wanted it.

PASTING

Two complete Svit pasting units. However since the glass is breaking up, they have decided to rebuild to toggle drying.

SOLE LEATHER

Sole leather drying is on bars from the roof. The setting of the sole leather is very insufficient, leaves a lot of creases which gives a lot of damage during rolling.

VACUUM DRYING

Two Gozzini Doublematic machines. One modified by been lifted 50-60 cm from the floor. This gives at least the maintenance a chance to go under for repairs. In addition to the normal water leaks, both machines suffer from low vacuum reading. Some (10%) can be explained due to pump cavitations due to altitude, but as the reading is not more than 50-55 cm Hg, and no detectable leaks could be found the rest must come from reduced efficiency of vacuum pumps. The effect is better than one would expect under the present readings.

CONDITIONING

So far there has not been much, but a home built machine will soon be ready.

STAKING

The Svit Molissa through feed operating with no problems.

BUFFING

Five machines all 5 feet wide. Two airblast dedusting machines which as normal does not clean sufficient. Manually blowing with compressed air to compensate.

PADDING

Two manually operated padding lines. Pigment added by pouring to the side and then manually padding. Both lines have drying

tunnel. In connection with one of the lines a curtain coater is set up.

SPRAYING

Two complete lines with two times spray and two times drying. Four gas spray units is to be replaced by new spraying units. A similar unit has been dismantled and a roller coater is set up in the end, so that the drying tunnels are in use.

EMBOSSING

Six Svit embossing machine. On one of these machines there took place an overhaul. The problem was basically that while pressing with time dwell the pressure dropped.

According to the producers manual this problem could be caused by only one valve. After a total pump overhaul this inspite several attempts did not solve the problem. It was finally after also having to overhaul the main valve that the problem was solved. The bypass channel indicated on the valve drawings was not were it should be, and thereby allowing yet one more valve to be the possible cause. After modifying the manual the other machines was checked and found to have some problems.

IRONING

One Aletti through feed ironing machine, not much in use as little of the production is ironed.

MEASURING

Two Svit pinwheel machines and one Carrara electronic machine.

SKIN SECTION

All the old pits for soaking is to be replaced by 4 new paddles at present under installation. When this is completed and the 9 new liming and 9 new tanning drums are in operation the capacity should increase to 15,000 skins per day. At the moment, due to the building activity they are down to 50% of originally capacity.

FLESHING SECTION

Svit machines and ten year old Aletti machine. The Aletti machine is getting close to having the same mechanical problem as the one in Ethiopian pickling plant, but here after 10 years of operation.

SAMMYING

One line of sam/setting machines. Working without any bigger problems. For the skin section approx. 65%, goes to finished 15% to pickled and the remaining 25% to wet blue.

The amount of finished shall increase and a line of shaving machines is ordered to assist in this.

DRYING

One tunnel dryer and one pasting unit, which shall be rebuilt to toggle dryer as for the hide section. 2 overhead dryers is also expected.

STAKING

Four slocum takers and one vertical staker.

FINISHING AREA

Spraying in one spraying line with two times spray and two times dry. Three Svit embossing machines and one Mercier finiflex. Two small vallero dry milling drums and finally one electronically bases measuring machine.

RECOMMENDATIONS

The Ethiopian tannery has one of the best possibilities to make a good quality leather among the tanneries visited. Nevertheless even for this tannery there is still a lot that needs improvement. As for the others quality of work must be improved. Better training to avoid errors and better understanding about the importance of yield. If the waste is to high, an increased number does not necessarily mean that productivity is higher.

The Ethiopian tannery has a very well developed maintenance system. It is complete down to spare part ordering and other details. Still one can find to many errors and wrongly adjusted machines. This again asks for better training and higher qualifications. The finishing area of the hide section has a good set up. As a result of this concentration of heated machines the air in the building gets very hot, this in a part of the country where the natural heat can be high in itself. This heat in combination with the presence of organic solvents used in finishing, leaves a poor working climate. From the roof a few propeller fans should solve this problem to a very low cost.

The effluent treatment plant which has been allowed to stand still the last 10 years and for this reason partly has broken

down, needs to be cleaned up, repaired and put back into operation.

MODJO TANNERY

Located 75 km from Addis Ababa, Modjo tannery is a small tannery doing sheep and goat skins to pickle, wet blue in the region of 8000-9000 per day. As for Modjo tannery the NLSC is planning a further developing into crust. This is partly in process as they have some dry machines and the lower gradings in a small scale already goes to crust. The Modjo tannery is originally a small crocodile tannery and as a part of the future this might come back in a small scale. The tannery employ's 265 workers including 18 maintenance members.

Soaking in Modjo takes place in 10 small paddles, each with a capacity of 300 skins. These are to be replaced with bigger paddles of which three were installed a few years back. These new paddles are inspite of their young age already showing bad signs of cracking in the top beam and also in leaving parallarity. The worst is already given 12 cm in the sideways direction. These two errors can only be caused by improper installing or by negligence of the expansion of the wood during swelling. The paddles are as for the rest of the tannery very dirty and this does not help to the situation.

FLESHING MACHINES

Three fleshing machines of which one, an old Gozzini machine was under overhaul. The problem which had been tended to as recently as three months back, was worn out bushes for the feed roller.

The only three months old repair was already worn out and the cause for this was bad repair, improper check of the feed roller and not enough accuracy in machining.

After dismantling the second time the cylinder was checked for straightness and found to have been bent on one end. The workshop in Modjo tannery is not equipt with bid enough lathe to cope with such a problem. The cylinder had for this reason to be sent to Ethiopian Tannery for the machine work. Due to the limited time we were not able to do any further work as the time was up when the cylinder in the workshop.

EFFLUENT SYSTEM

Modjo Tannery has for the last four years had all the equipment for an effluent treatment plant on stock, at the factory land. Due to the high civil works cost, it has not been possible to build and get the system into operation.

The Modjo tannery has the same maintenance system as the rest of the tanneries visited, but as for the other tannery of the same size, Ethiopian pickling, Modjo is having bigger problems, than the bigger tanneries. They also claims to claim to have spare parts problem, which most likely is due to the limited number of machine and thereby no system or procedure in spare parts ordering. When you experience a delivery time as in Ethiopia of between six months and one and a half year one has to be prepared.

RECOMMENDATIONS

The maintenance quality must be uplifted. As for the other tanneries visited the lack of accuracy brings the same repair over and over again. Modjo tannery has to seek advice from the bigger tanneries of what spare part system they prepare to be reasonable safe. The improper cleaning of both machines, equipment and surroundings in general can not continue.

The supplier of the new paddles should be contacted in order to seek advice on how to repair the paddles which are damaged. The tannery being the possession of all the equipment for an effluent treatment plant should seek the necessary funds for it to be completed.

END COMMENTS

The National Leather & Shoe Corporation has done and are still doing a good job for the leather industries in Ethiopia. The rehabilitation scheme partly under operation also indicates that the industries will continue to grow.

From a maintenance point of view there are however a few things that need more attention. The number of trained and experienced engineers should be higher. This problem results in to many breakdowns, to many errors, to many badly done repairs and to much destroyed leather because of wrong adjustments. If nothing happens this problem will increase as the new machines gets more complexed and complicated.

Effluent is for all the tanneries a big problem. The fact that all the waste water goes to rivers or lakes, leaves this issue as a very important matter.

RECOMMENDATIONS

Within the tanneries connected to the NLSC there are a lot of machines that needs a thorough overhaul. This would make them capable of still work at a very good level for many years.

None of the tanneries has the workshop equipt to do such, to the standard required. If one could imagine one such workshop established, fully equipt to as a professional workshop, it would be capable, run by the experienced engineers available, to do such overhauls and also act as an education center for untrained and inexperienced maintenance personnel. All the smaller machines and parts needed attention from the bigger ones, can be transported to such a place for qualified work to be done.

This does not mean to reduce the standard of the local work shop. On the contrary, as knowledge improves, also the local workshops will increase in quality and standard.

In effluent, the amount of water to be treated is connected to the costing. If one can seek to minimise the water that needs to be treated also costs can be reduced. For tanneries close together, one joint plant will be cheaper than to separate.

PROPOSAL FOR NEXT VISIT'S SEMINAR

Since thickness adjusting, splitting and shaving is a common problem for most of the tanneries visited this subject could be a reasonable basis for a seminar.

With proper preparation, there could be arranged checking and readjusting of splitting machines and shaving machines. As

chatter is a problem within the same machine category and since, a lot of this comes from improper reblading, also a reblading course could be be held at the same time. In the later matter including the introduction of more rational tools than pure hand work. If this proposal is generally accepted, some work will have tc be done prior to arrival to ensure the availability of spares and other materials needed. The time would have to be set reasonable, less than 7-8 working days would be pointless.

As for this visit leaving only a few days in each tannery the time is to short to do a real working visit. The danger of leaving a track of dismantled machines becomes to big.

PEOPLE MET IN ETHIOPIA

National expert Mr. Seyum Hailu
He had everything prepared prior to arrival and proved very efficient with all problems that surfaced.

From NLSC
General Manager Mr. Yilma Adamu
Technical department head Mr. Asnake Erqou
From NLSC's technical department Mr. Tamiru Bogame whom I spent a lot of time together with and who really knows about tannery machines.

From Awash Tannery.
General Manager Mr. Mesren
Chief maintenance head Mr. Belete Debaba
Chief production head Mr. Abdulahe
From Addis Tannery.

Chief maintenance head Mr. Alula

Chief production head Mr. Mulat Mamo

From Ethiopian Tanning & Pickling Factory.

General Manager Mr. Leule Berehane

Chief maintenance head Mr. Hayele Mekael

Chief production head Mr. Haylu

From Ethiopian Tannery

Deputy Manager Mr. Kidanu Chekol

Chief maintenance head Mr. Mekonen

Maintenance members Mr. Medehene Baheta, Mr. Alemayehu Abebe and Abedeza

From Modjo Tannery

General Manager Mr. Zeweg G/meskel

Chief maintenance head Mr. Getachew Tesema