ORGANIZATIONAL CHANGES AND NEW APPOINTMENTS ANNOUNCED

BEIRUT — Numerous developments in the management organization structure of the company were announced here June 9 by President John Noble. Effective June 9, the following appointments were made: Mr. D. T. Pinckney was appointed Manager of Operations; Mr. C. H. Pope became Manager of Operating Services; and Mr. A. E. Olson was named Chief Engineer—Communications. After service in 1950 and being promoted to Assistant Chief Engineer—Pipeline, Mr. A. E. Olson has served as Chief Engineer—Communications. With Tapline since 1946, Mr. Olson was affiliated with SOCAL. He is a 1942 graduate in civil engineering from Oregon State College. He has the highest academic average ever attained at this school. One of his notable contributions to the field of communications has been his work on the booster pump installations at Qaisumah, Kafra and Badanah. Prior to joining Tapline, Mr. Olson was affiliated with Standard Oil of California. The new appointments were effective June 9, the following appointments were made: Mr. D. T. Pinckney was appointed Manager of Operations; Mr. C. H. Pope became Manager of Operating Services; and Mr. A. E. Olson was named Chief Engineer—Communications. Formed as a new department heads will report to the Oil Industry. During construction of Tapline, he functioned as Superintendent of the Eastern Division with headquarters in Saudi Arabia. Later he was promoted to Assistant Manager of Operations, Beirut. Mr. Pinckney was previously associated with the Standard Oil Company of California, the Bahrain Petroleum Company and Aramco.

With Tapline since 1947, Mr. Pope has a 40-year career in the oil industry. During construction of Tapline, he functioned as Superintendent of the Pipeline Shop Building. All work pertaining to the turbine shop facilities at Turaif were completed at the end of May—thus making this item of the capacity increase program 100% complete. Shown above is an exterior view of the Turaif Machine Shop building where miscellaneous work in progress was completed on May 25. (Photo by Nasr).

All phases of work pertaining to the turbine shop facilities at Turaif were completed at the end of May—thus making this item of the capacity increase program 100% complete. Shown above is an exterior view of the Turaif Machine Shop building where miscellaneous work in progress was completed on May 25. (Photo by Nasr).

Detailed descriptions of progress on individual items, as reported by Tapline Engineering, are given in the following summary:

**WORK COMPLETED ON 90,000 BPD PIPELINE BOOST**

The end of May witnessed the completion of tapline facilities at Turaif, thus winding up the 90,000 BPD program. On May 9, the central shop facilities were inspected and judged complete by the Acceptance Committee on May 31 at which date they were turned over to Operations. The 90,000 BPD program reached completion, all attention and manpower was directed during May to the 25,000 and 15,000 BPD programs. The booster pump installations at Qaisumah, Kafra and Badanah were also finalized. Final inspection of these three locations was completed during June. Pumphouse additions at the same three locations were 92.5% complete. Detailed descriptions of progress on individual items, as reported by Tapline Engineering, are given in the following summary:

**APU's:** All minor additional work at Jalal was completed and the construction crew pulled out on May 9. As the 90,000 BPD program neared completion, all attention and manpower was directed during May to the 25,000 and 15,000 BPD programs. booster pump installations at Qaisumah, Kafra and Badanah were also finalized. Final inspection of these three locations was completed during June. Pumphouse additions at the same three locations were 92.5% complete. Detailed descriptions of progress on individual items, as reported by Tapline Engineering, are given in the following summary:

**Communications:** The fabrication of the cable rack for the VHF radio tower at Jalal was finished during the past month. Installation was 100% complete. During the first week of May, installation was finished during the past month. Installation was 100% complete during the first week of May. Pumphouse additions at the same three locations were 92.5% complete. Detailed descriptions of progress on individual items, as reported by Tapline Engineering, are given in the following summary:

**Tankage:** All work on the 180,000 barrel tank has been completed. Work on the booster pump at Jalal was finished during May. The exception to final in situ is scheduled to take place during the first week of May. Detailed descriptions of progress on individual items, as reported by Tapline Engineering, are given in the following summary:

**Turf Shop Building:** All items of work pertaining to the Turaif shop building were completed on May 25, thus making this item 100% complete. Detailed descriptions of progress on individual items, as reported by Tapline Engineering, are given in the following summary:

**Booster Pumps:** The remaining work on the booster pump at Jalal was finished during May with the exception of final in situ. Pumphouse additions at the same three locations were 92.5% complete. Detailed descriptions of progress on individual items, as reported by Tapline Engineering, are given in the following summary:

**Piping:** Complete test runs on Piping are now being performed on the booster pump at Jalal. Detailed descriptions of progress on individual items, as reported by Tapline Engineering, are given in the following summary:

**Paint:** The final coat of paint was applied on the booster pump at Jalal on May 9. Detailed descriptions of progress on individual items, as reported by Tapline Engineering, are given in the following summary:

**Centrifugal Pumps:** The final test run on the booster pump at Jalal was completed on May 9. Detailed descriptions of progress on individual items, as reported by Tapline Engineering, are given in the following summary:

**Field Testing:** All work on the booster pump at Jalal was completed on May 9. Detailed descriptions of progress on individual items, as reported by Tapline Engineering, are given in the following summary:

**Construction:** All construction work was completed on the booster pump at Jalal on May 9. Detailed descriptions of progress on individual items, as reported by Tapline Engineering, are given in the following summary:

**Hiring:** All hiring was completed on the booster pump at Jalal on May 9. Detailed descriptions of progress on individual items, as reported by Tapline Engineering, are given in the following summary:

**Labor:** All labor on the booster pump at Jalal was completed on May 9. Detailed descriptions of progress on individual items, as reported by Tapline Engineering, are given in the following summary:

**Equipment:** All equipment on the booster pump at Jalal was completed on May 9. Detailed descriptions of progress on individual items, as reported by Tapline Engineering, are given in the following summary:

**Miscellaneous:** All miscellaneous items on the booster pump at Jalal were completed on May 9. Detailed descriptions of progress on individual items, as reported by Tapline Engineering, are given in the following summary:
TAPLINERS ATTEND SCHOOL EXERCISES...

Machine Tool Operator Trainee, Akla bin Hassan (left) is now being trained by Muhammad Rafik on the use of a Cincinnati milling machine at Tapline's Central Machine Shop. He attended classes at the Development School and job training course conducted at the machine shop to Mr. J. F. Chaplin. (Photo by Naar).

While there are many who can claim longer service in the company than Akla bin Hassan, there are none in the area in greater endeavors for self-improvement.

Born in Scata, Saudi Arabia, Akla joined Tapline in January 1976 as a machinist-grad. in Transportation in Turaif station where he is still employed. Prior to that date, Akla had made marked achievement with his studies at the Scata School where he learned to read and write Arabic—still employed. Prior to that, he was trained by Muhammad Rafik on the use of a Cincinnati milling machine.

In March ’76, after three months of service, Akla was promoted to Tool Room Operator. He worked in that capacity for one year gaining such operational experience that he was again promoted to the position of Machine Tool Operator-Trainee.

Presently, Akla is being trained by Multiple Machine Tool Operator, Muhammad Rafik on the use of a Cincinnati milling machine. With an eagerness to learn and a desire to advance himself, Akla has not only mastered the Cincinnati milling machine, but has also mastered the practical aspects of the trade.

He is taught simple and arithmetic methods of his work to his advantage.

TAPLINERS ATTEND SCHOOL EXERCES...
**CATHODIC PROTECTION OF TAPLINE**

Originally from Aley, Lebanon, cathodic protection analyst Fadel M. Maasry is a former A.U.R. student and a 1950 graduate of the University of Texas with a B.S. degree in Chemical Engineering. He joined the company in January 1951 and presently holds the position of Head Corrosion Engineer.

Last year, Mr. Maasry was delegated by Tapline to attend the 13th Annual Conference of the National Association of Corrosion Engineers held at St. Louis, Missouri, March 11-15, 1957. As a member of the N.A.C.E. group, Mr. Maasry presented to the Conference a paper entitled: "Control of External Corrosion on the Trans-Arabian Pipeline." In the following article, he explains to Periscope readers the system of cathodic protection and the Tapline program in that field.

**WHY UNDERGROUND PIPE CORRODES**

If you buy a battery for your flashlight, and it wears out, you just throw it away and buy another one for a few dollars. But, if you buy a 100 million dollar pipeline, and it wears out—well, you can see it's a little more expensive. So, what we do is try to figure out ways so it won't wear out—including ways to prevent the thing that makes flashlight batteries quit working: corrosion.

As a matter of fact, ways have been figured out, and one of the most ingenious is a system called "cathodic protection." It's very important to Tapline because all below-ground structures are subject to corrosion: an electro-chemical action in which metals rust or rot away by combination with soil chemicals in the presence of moisture. This same chemical action is the basis of the common dry cell or dry battery. Zinc, which is the same metal as used for galvanizing the surface of a pipe is used for a container (Fig. 1). A carbon rod is used as the center electrode. The space between is filled with an electrolyte, i.e., a current-conducting material.

When a wire or lamp is connected between the zinc and the carbon, an electrical circuit is made and chemical action causes current to flow from the zinc into the chemicals, through the chemicals to the carbon, and through the wire or lamp back to the zinc. The flow of electric current from the zinc to the chemicals carries particles of zinc with it, or as is commonly said, the zinc corrodes; and when it is practically corroded away, little or no current is generated and the dry cell or battery usually is thrown away.

The electrode from which current flows into the chemical solution is known as the anode and will be destroyed by the current flow. The other electrode is called the cathode.

**PIPELINE CELLS**

Let's now see how this sort of business applies to pipelines. In their case, the earth around the pipe—containing water, chemicals and oxygen—serves as the electrolyte. The pipe itself serves as anode; cathode and conductor. The action of the self-corrosion is actually similar to that of the dry cell: the zinc metal, moisture and oxygen, sets up natural galvanic cells and little circuits of electricity wander their way into and out of the pipe. The point of entry to a equivalent to a battery cathode: the point of departure is, in effect, the anode. And, just like in the battery, the current does no harm at the cathode, but, every time an electrical charge leaves the anode, it carries an infinitesimal bit of metal with it, depositing it on the outside as rust or scale or rust. This process occurs in the pipe as it has infiltrating termites. At least, that's what happens if you don't have cathodic protection.

Cathodic protection engineers have succeeded in getting something similar from the pipe to take the role of the unhappy anode. The pipe, in other words, becomes a trouble-free cathode.

How is that done? An "anode bed" of graphite (or scrap metal) is buried about 600 feet from the pipeline. The current is fed to the anode bed, then goes through the ground to the pipeline, then along the pipe to the "drain point" on its way back to the negative terminal of the generator. Thus, a complete circuit is working and the graphite for the scrap gets the corrosion instead of the pipe.

What has happened to the electrical charges that used to move into and out of the pipe as the result of chemical action of the soil? — The answer is that they can still move in, but they can't move out—except at the drain point—because they are constantly being pulled back by the stronger current from the generator.

**CATHODIC PROTECTION PROGRAM FOR TAPLINE**

On the 754 miles of line between Qamash and Sabra, about 379 miles are underground: slightly more than 133 miles in Saudi Arabia and the entire 245 miles from Tarut to Sidon Terminal. Cathodic protection is applied to all buried and submerged metallic structures of Tapline. This includes, aside from the underground sections of the main line, five submarine berths at the terminal and the submerged steel surfaces of the company's tugboats.

Actually, the cathodic protection program for the Tapline system was started as soon as the pipe was laid in the ground. Cathodic protection units were installed in each of the four pump stations, Qayrawan and the Sidon terminal. These units are rectifiers and ground beds.

Magnesium anodes were also used to suppress galvanic cells on the intermediate sections of the main line in Saudi Arabia. Cathodic protection achieved from these systems was soon found to be very limited. In fact, the constant increase in current requirement due to progressive setting of backfill around the pipe and deterioration of the pipe coating, soon necessitated the establishment of cathodic protection stations at shorter intervals along the line.

Since power is not available along the line, rectifiers could not be used to supply the necessary current. Diesel-driven generators were found to be the most economical source of current for the cathodic protection of the main line.

The first unattended cathodic protection station was completed in January 1952 at Km. 1072, in Syria. Each of the unattended stations has two generating units. Each unit, in turn, consists of a 6.5 kw Dornhoff generator directly to a 12.5 hp Deutz diesel engine. For best results, these units are operated alternately with periodic inspections and overhaul programs. Reliable traveling rectifiers are slated for installation at these stations to record performance of the equipment.

With twenty-four unattended cathodic protection stations constantly on duty, pulling that current which the soil chemicals carry, the potential of 99.9% of the buried portion of the main line is maintained, generally accepted protection criterion. The potential of the remaining 0.1% will be raised after these sections are reinforced. The mainline of the pipe at these locations is scheduled for completion in 1958.

Furthermore, twenty-two rectifier systems now in operation in the pump stations and Sidon terminal to protect station piping, raw water tanks, bottoms of crude oil tanks in Sidon, and all the submersible berths. Qamash and Raffa have four rectifiers each. Bu Dair, and Tarut, five each, Qayrawan, one, and Sidon, seven. Two rectifier systems, will be installed this year, each in Jalamid and Umm Qasr in supplement the protection on the main line. Additional anodes are also slated for installation this year to supplement the protection on line in the still not fully protected sections of piping in the industrial area of the pump stations.

**Fig. 1**

*A suitable ground anode bed, consisting of either scrap pipe or graphite, is buried in the soil (background) about 600 feet from the main line. A generator, housed in the UCP station shown at left, is used to supply electricity current—with the positive terminal connected to the ground bed and the negative to the pipeline (shown in the background). The flow of current onto the line keeps the galvanic cells along the line inactive.*
Serving as Acting General Superintendent with headquarters at Turaif is Mr. G. F. Heide.

With a staff of 56 company employees, Turaif Central Storehouses are subdivided into four sections—Office, Cargo Handling, Receiving and Issuing, and Capacity Increase Program. Messrs. Adel Noujaim, Abdou Chebib, B. E. Sader and Maurice Nasr are respectively, in charge of these divisions. Five hundred tons of cargo are handled monthly by the Cargo Handling Section which uses a Lorain crane, an Austin-Western crane and two Towmotor fork-lifts.

Working on stock control cards which show balances of all items that are in stock at the Turaif Central Storehouses are (right, foreground to background) Storehouse Clerks K. A. Khalid, K. I. al-Baladi, Y. Saadeh, and A. Nassif. Others (right to left) are G. Aticlah, Senior Storehouse Clerk; R. J. Quick, Coordinator of Stores; A. Noujaim, Office Supervisor; M. G. Bottger, Turaif Storekeeper; M. Nasr, Construction and Material Specialist; S. Nassar, Lead Storekeeper; and S. A. S. Baharoon, Posting and Filing Clerk.

The Receiving and Issuing crew of Turaif's Central Storehouses includes (foreground, left to right) Stockmen: B. E. Sader, Store Supervisor; Stockmen: A. Noujaim and A. M. Naif, Lead Stockkeeper B. E. Sader, Lead Storekeeper M. Nasr, Lead Stockkeeper M. Nasr, and Lead Stockkeeper J. Daniel. There are more than 40,000 items in stock at the Central Storehouses and $4.7 million worth of inventory.

Construction Coordinator F. W. New is in charge of all Tapline construction in progress. He supervises a number of local, both contractors who have come 200 to 700 employees on their payroll—depending on the amount of work in progress. Above, he is seen discussing a contract with Frank Robert, Tapline Clerk.

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At a weekly safety meeting for the mechanical crew at Turaif station, team captain J. F. Chaplin (right) outlines safety facts and aids to (left to right) H. Soley, H. Assali, R. Hamade, M. Ghazi, H. Ali, M. Obaliek, J. Q. Cassella, Pipeline Repairman; and J. E. Hughes, Pipeline Maintenance Foreman.

The Machine Shop office at Turaif comprises (foreground to far left) J. F. Chaplin, Machine Shop Foreman; H. L. Krapp, Mechanical Supervisor; B. Abou-Khater; E. Q. Cassella, Pipeline Repairman; and J. E. Hughes, Pipeline Maintenance Foreman.

Under the supervision of General Foreman - Central Maintenance C. G. Rush, the Central Maintenance crew at Turaif handles all maintenance work which is too large for Station Maintenance to handle. The crew undertakes such assignments as the installation of APU's; the painting of tanks, etc. Available for the photograph at the Furniture Repair Shop were (left to right) Mr. Rush; A. Hableh, Asst. Foreman - Construction; N. N. Azar, Construction Engineer; M. A. Durrah, Asst. Foreman - Construction; M. B. Saoud and A. A. Humaid, Furniture Repairmen.

Part of the Central Mechanical Shops at Turaif is the Fuel Injection Room where fuel pump lubricators, Woodward governors, fuel nozzles, Sunstrand fuel pumps, Maxwell fuel regulators and fuel line valves are repaired. Assigned to this section are (right to left) M. Abdallah, Z. Tarrad, and A. Dahim.

Rewinding electric motors at the Central Electrical Shop are (left to right) M. Abaliek, E. Farouk, and A. Dakun.

Special classes for Mechanical Shops employees were started last March by Machine Shop Foreman J. F. Chaplin (right). He is shown explaining root pitch and angle diameters to (left to right) A. B. Hassan, A. A. Sahlan, S. Ghuthayan and M. Obaliek. The students are taught simple mathematics relative to their work in the mechanical shops. They also learn to read blueprints.

Floor and Bench Machinists Beshir Ahmad (right) instructs Machine Tool Operator-trainee Salem Ghuthayan on the operation of a Sydney lathe used for cutting taps and threads.

Head Welder H. Soley (foreground) supervises the Welding Shop at Turaif. Assigned to that division of Central Facilities are Welders (left to right) S. B. Omar, E. Abou-Haidar, and M. Abaliek.

Working, respectively, on an electric drill, the repair of a fuel meter, lathe, and the elements of an electric bakery oven are (left to right) Electricians S. Tawoos, A. Abaliek, A. Sahlan, and J. Selaf.

Building and repair work on an electric drill (foreground to far left) J. F. Chaplin, Machine Shop Foreman; B. Abou-Khater; E. Q. Cassella, Pipeline Repairman; and J. E. Hughes, Pipeline Maintenance Foreman.

The electrical crew at Turaif comprises (foreground to far left) J. F. Chaplin, Machine Shop Foreman; H. L. Krapp, Technical Supervisor; B. Abou-Khater; E. Q. Cassella, Pipeline Repairman; and J. E. Hughes, Pipeline Maintenance Foreman.

Studying buckets on a first stage wheel for the gas turbine are (left to right) H. J. Soley, Assistant Machine Shop Foreman; B. Abou-Khater; Lead Multiple Machine Operator; and H. B. Ali, Floor and Bench Mechanic-Trainer.
Mr. S. Farhat

Turaif also welcomes Sami Mudaweh, hometown is Kafroun, Syria. He graduated from the Ecole Technique de Commerce," as a machinist. He is member of the Zahrani Country Club in Beirut, Mr. Farhat previously in stateside vacations; Messdames and children have departed on their honor indicated how much they will be missed around here. On the other hand we were all glad to welcome the Station Superintendent and Mrs. H. C. Davis back from leave. Again the joy was demonstrated in the many welcome parties given to honor the occasion. In the same month, Beverly Thomas, daughter of Mr. and Mrs. R. A. Thomas of the Eu- ruka School at Eureka, Illinois, arrived here on a summer vacation visit.

Another summer vacation visitor is Gordon Ragaipe, son of Mr. and Mrs. Richard Ragaipe, of the Kemper Military School, Bentonville, Missouri. He is a cadet sergeant first class. Gordon received honors in the 14th annual commencement program held at the school on May 12. He also received a Kemper scroll as leader of the first platoon and a leadership, drill and exercise command in the Kemper corps. He was leader of the first squad, second platoon. Cad. D. H. Young, which was awarded the Gorger Trophy.

Mr. S. Farhat

The third newcomer to join Turaif's community is Mr. G. Mudawah. He will work in the station's dining Hall as a kitchen helper.

The welcome mat is also out for Malak Salloum, nurse, who joined Turaif's hospital staff. She was born in Tripoli, Lebanon, in February 1958. His hometown is Kafroun, Syria. He graduated from the Zahrani Country Club in Beirut, Mr. Farhat previously in stateside vacations; Messdames and children have departed on their honor indicated how much they will be missed around here. On the other hand we were all glad to welcome the Station Superintendent and Mrs. H. C. Davis back from leave. Again the joy was demonstrated in the many welcome parties given to honor the occasion. In the same month, Beverly Thomas, daughter of Mr. and Mrs. R. A. Thomas of the Eu- ruka School at Eureka, Illinois, arrived here on a summer vacation visit.

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During the same period, Suhail Sadik, youngest member of the New York engineering staff, graduated from Amator on January 15, 1951 and was with the Executive Management Staff before transferring to Tap Oil Company. Welcome to Mr. Arthur Vogel, newest member of the New York engineering staff, Alt. a graduand of Little Neck, New York, graduated from the Cooper Union, New York City.

Turaif also welcomes Sami Mudaweh, hometown is Kafroun, Syria. He graduated from "Ecole Technique de Commerce," as a machinist. He is member of the Zahrani Country Club in Beirut, Mr. Farhat previously in stateside vacations; Messdames and children have departed on their honor indicated how much they will be missed around here. On the other hand we were all glad to welcome the Station Superintendent and Mrs. H. C. Davis back from leave. Again the joy was demonstrated in the many welcome parties given to honor the occasion. In the same month, Beverly Thomas, daughter of Mr. and Mrs. R. A. Thomas of the Eu- ruka School at Eureka, Illinois, arrived here on a summer vacation visit.

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Qaisumah
by M. Jaouni
Qaisumah welcomed in June a newcomer to the station—Dr. R. E. Sabbagha, of the American University of Beirut. While at AUB, he was on active duty with the American Red Cross in the Lebanon. He was previously a member of the Lebanese Red Cross. He was married to the widow and seven children to whom Tapline personnel extend their deepest sympathy.

ALONG THE LINE

Qaisumah

By M. Jaouni

Qaisumah welcomed in June a newcomer to the station—Dr. R. E. Sabbagha of the American University of Beirut. While at AUB, he was on active duty with the American Red Cross in the Lebanon. He was married.

Tapline personnel extend their deepest sympathy.

Dr. R. E. Sabbagha

During May, we welcomed the return of vacationers Ali bin Yousuf, Muhammad Himri, Ali Ibrahim, Kassem and Sleiman bin Yousif. The group is holding a farewell party in the station bars.

Badanah also welcomed Mr. Ayad bin Anad to the base hospital from Aramco. Mrs. Zina Ghanner, on summer vacation, was taken to hospital in Tripoli, Lebanon. She is a member of the British Students' Association. Dr. Sabbagha is married.

Mr. Karam enjoys tennis, ping-pong and volleyball.

Badanah welcomed Mr. Ayad bin Anad to the base hospital from Aramco. Mrs. Zina Ghanner, on summer vacation, was taken to hospital in Tripoli, Lebanon. She is a member of the British Students' Association. Dr. Sabbagha is married.

ALONG THE LINE

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