Part I: Licensor View of Arrangement

Case history of successful license arrangement between U.S. and Australian steel manufacturers

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In June 1972 the Bethlehem Steel Corporation, a large integrated steel company in the United States, began commercial production of a new patented hot-dip coated sheet steel product that was sold under the tradename Galvalume sheet. Galvalume sheet is coated with an alloy of 55% aluminum, about 1.5% silicone, with the balance zinc. The coating is described in this paper as a 55% aluminum-zinc coating, and steel having this coating is described as aluminum-zinc coated steel. The 55% aluminum-zinc coating, is oxidation-resistant, and steel to which the coating is applied is provided with more galvanic protection to cut edges and areas where there is mechanical damage to the coating than occurs with steel having an aluminum coating.

In 1973 Bethlehem gave consideration to, and embarked upon, a worldwide program to license its foreign patents and technical information applicable to aluminum-zinc coated sheet steel. The first company licensed by Bethlehem was John Lysaght (Australia) Ltd., referred to in this paper as JLA.

This paper describes the events that led to the development of Bethlehem's aluminum-zinc coated steel, the commercialization of Galvalume sheet, and the patent protection obtained for the development, as well as the license strategy, program, and negotiations that resulted in JLA becoming the first licensee.

BACKGROUND

In 1957 Bethlehem's board of directors made a significant commitment to research by approving construction of a multi-million-dollar research center in Bethlehem, Pennsylvania. At the time Bethlehem's research group was part of the Steel Division and had about 250 employees. The research group grew in numbers and importance and in 1959 became a separate department of the corporation headed by a vice-president. By the time the research center was completed and occupied in October 1961, the department numbered almost 500, practically all, including Patent Division personnel, were located in the research center.

The growth in personnel of the Research Department enabled Bethlehem to conduct work in technical areas not previously investigated. In 1962 the Corrosion Group, Chemistry Division, of the Research Department undertook a program to find a better steel coating material than either aluminum or zinc. The Corrosion Group personnel hoped to develop a steel coating that would combine the favorable long-term corrosion resistance of aluminum coatings with the galvanic protection afforded by zinc coatings.

The program was successful, and Angelo Borzillo and Dr. James Horton made what they considered an important invention. They invented an aluminum-silicon-zinc alloy coated steel that appeared to possess superior corrosion resistance characteristics. The Borzillo-Horton invention was submitted to the Patent Division of Research for a patentability investigation.

The Patent Division had responsibility for Bethlehem's intellectual property matters, i.e. patents, trademarks, and copyrights. The bulk of the division's work related to patentability investigations of inventions made by Bethlehem personnel, particularly those of the Research Department, and to the preparation and prosecution of United States patent applications directed to the inventions.

A benefit of having the Patent Division physically located at the research laboratories was that Patent Division personnel were generally on first-name terms with research inventors, and communications between them were excellent. Most discussions concerning inventions were on a face-to-face basis rather than in writing, over the telephone or through patent liaison people. The Borzillo-Horton patentability investigation was assigned to Duffield Hoy, an experienced patent agent. Upon completion of his investigation he concluded that, in his opinion, the invention appeared patentable. Mr. Hoy prepared and filed a United States patent application directed to an aluminum-silicon-zinc alloy coated steel product and to a method of making the product. At the time, ongoing tests of the product appeared so successful that it was decided to file patent applications corresponding to the United States application in many foreign countries that had facilities for producing coated steel products.

Two Patents

As a result of Mr. Hoy's work and the excellent cooperation that he received from the inventors and other research personnel, Bethlehem was granted two United States patents, one having claims directed to an aluminum-silicon-zinc alloy coated steel product and one having claims directed to a method of making the product. The original application had been divided into two separate applications due to certain procedural requirements of the United States Patent Office. Corres-

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ponding patents were subsequently granted to Bethlehem in Australia, Canada, India, Japan, South Africa and in countries of Europe.

Work on the aluminum-zinc coated steel development proceeded slowly. Accelerated tests supported the inventor's position regarding the excellent corrosion resistance of the coated steel. However, it was necessary to corroborate the results of the accelerated tests with atmospheric tests that required several years to complete. The road from the laboratory to commercialization was long and difficult.

Research personnel at all levels had to be convinced of the superior corrosion resistant characteristics of the aluminum-zinc coated steel in order to obtain support and funding for continued work. Subsequently, personnel of the Sales and Steel Operations Departments had to be persuaded to permit modifications, at considerable expense, to a continuous hot-dip galvanizing line for full scale production trials for aluminum-zinc coated sheet steel. Problems were encountered and solved.

Additional inventions were made, and patent applications directed to the inventions were filed in the United States and in many other countries. However, there remained one major area of uncertainty. Could aluminum-zinc alloy coated sheet steel be sold competitively against galvanized steel, which was also made and sold by Bethlehem, and against aluminized steel, a product neither made nor sold by Bethlehem?

The Sales Department developed a trial marketing plan, which was implemented and considered a success by Bethlehem personnel. As a consequence, a continuous hot-dip galvanizing line at Bethlehem's Sparrows Point plant was taken out of service and modified to produce 55% aluminum-zinc coated sheet steel. Based on extensive studies of 1-70% aluminum-zinc alloy coatings on sheet steel, the 55% aluminum-zinc coating was found to have the optimum combination of corrosion resistance, heat resistance, and galvanic protection of sheared edges. In the spring of 1972 production of the new coated product began, and it was sold under the trade name Galvalume sheet.

BETHLEHEM'S PATENT AND LICENSING PRACTICES

Historically, Bethlehem took a passive or defensive attitude toward patents. Bethlehem sought patents in the United States for Bethlehem inventions to permit Bethlehem to practice and use the inventions and to prevent others from practicing and using them without Bethlehem's express permission. Bethlehem sought foreign patents in only limited instances. Licensing by Bethlehem, to the extent it was done, generally involved Bethlehem's acquisition of other companies' developments, i.e. licensing in.

The licensing was done on an ad hoc basis by the departments directly involved, usually Steel Operations, Shipbuilding, Purchasing, and Research. Since the licensing generally involved patents, Patent Division personnel became involved in the negotiations and gained valuable experience with respect to both negotiating and drafting license agreements.

While Bethlehem, in many instances, was willing to license its developments to other companies, i.e. licensing out, that type of licensing was not actively promoted. Licensing out was done in a passive manner, usually at the request of another company that had learned of a Bethlehem development. Possibly the main reason for the passive attitude was because there was no one group or department at Bethlehem that was specifically assigned responsibility for promoting the licensing of Bethlehem's developments.

During the period of development and commercialization of Galvalume sheet, Research Department personnel became involved in two programs, one active and one passive, to promote the licensing of developments to other companies, i.e. licensing out.

The first licensing out program involved continuous slab casting practices jointly developed by Bethlehem and several other steel companies on an experimental pilot line at a Bethlehem plant. The companies that participated in the joint program designated Bethlehem to promote the licensing of the practices throughout the world. The licensing program met with limited success because, at the time, there were few continuous slab casting machines in the United States and there was no way to demonstrate the practices to potential licensees, since the pilot line had been shut down shortly after the practices were developed.

Second Program

The second licensing out program took place in 1972-73. Bethlehem, with some reluctance, licensed its technology applicable to certain types of plate to a foreign licensee, at its request. Under the terms of the license agreement, Bethlehem made a disclosure of its technical information and provided assistance to the licensee, both at a Bethlehem plant and at the licensee's plant abroad. Personnel of both the Alloy Development Section, Product Research Division, which evolved from the Chemistry Division, and the Patent Division were directly involved in the license negotiations. The transfer of technology was implemented by Research, with the assistance of personnel of the Steel Operations Department. Approval for the license had to be obtained from several departments at Bethlehem. For example, before any license discussions were initiated, prior approval was obtained from the Steel Operations, Sales, Industrial Relations, Public Affairs, and Research Departments. This was a cumbersome procedure, and an objection from any one of the departments could have precluded any license negotiations.

The two programs had a positive influence on the attitude of Research Department personnel toward licensing out. They had become familiar with the efforts required to actively promote a license program, the difficulties involved in foreign travel and negotiations with potential licensees, and the expenses and potential rewards of a license program. At this stage, while Research personnel had developed some expertise with, and an understanding of, the difficulties and rewards of licensing out, personnel of other departments were less aware of the opportunities afforded by a successful license program.

DEVELOPING A LICENSE STRATEGY

Even before Bethlehem initiated production of Galvalume sheet, several foreign companies, including JLA, had learned about the new product, inquired about it, requested samples, and asked about a license. As a result of the substantial interest of other companies in the Galvalume sheet developments, several people in the Patent and Product Research Divisions advanced the idea of actively promoting the licensing of the developments. Dr. D.J. Blickwede, then Vice-President of Research, strongly encouraged the idea. It was generally recognized that Bethlehem's ability to exploit foreign market possibilities for Galvalume sheet was limited both by its price in comparison with competitive products, e.g. galvanized sheet and aluminized sheet, made abroad and by high freight costs to foreign countries. Foreign investment in a new facility, either alone or jointly with another company, was excluded by Bethlehem's limited capital. That left licensing as the only way for Bethlehem to benefit abroad from its Galvalume sheet developments. Early in 1973 a special committee was formed to consider a license strategy. The committee included representatives from Research's Patent and Product Research Divisions and from Sales Engineering and Galvanized Sales. It was recognized that without the support of Sales personnel there was little chance of obtaining approval to license the developments.

Notwithstanding the experience of Research personnel with licensing, the experience did not provide easy answers to all of the questions raised concerning a worldwide license strategy. A few of the questions were:

- In what countries does Bethlehem have patent protection?
- How good are the patents?
- Would a foreign licensee be able to export its products to the United States and to other countries where Bethlehem had patents directed to the aluminum-zinc coating developments?
- What royalties should be established for a patent license?
- What fee should be charged for a disclosure of Bethlehem technology?
- Should Bethlehem provide a licensee with start-up assistance?
- Should Bethlehem provide a licensee with marketing assistance?
- What about improvements?
- Who is going to handle the license activity, i.e. promotion and negotiation?
- Who is going to implement the transfer of technology and provide whatever other assistance is required?
- Where do we start?

Responsibility

Dr. Blickwede assumed responsibility for promoting the licensing of the aluminum-zinc alloy coating developments. Since the developments had been made by Research personnel, since Research personnel possessed the greatest amount of licensing experience in the corporation, and since there was no department at Bethlehem specifically assigned responsibility for licensing, Dr. Blickwede concluded that no other department was as well equipped to promote the licensing of the Galvalume sheet developments. Research started the ball rolling.

In trying to develop a strategy, the license committee was faced with negative and positive variable factors that had to be considered. At the time, 1973, galvanizing lines throughout the world were operating at full capacity and there was concern that potential licensees might not be willing to accept the down time, and consequent loss of production, to convert a continuous galvanizing line to a 55% aluminum-zinc alloy coated sheet steel line. There was also concern whether potential licensees would accept the results of Bethlehem's corrosion tests or insist upon making their own tests, which would require several years.

On the positive side, the rapidly escalating price of zinc offered potential producers of 55% aluminum-zinc coated sheet steel substantial savings compared to the cost of producing galvanized sheet. Last but not least was the advantage, which could not be quantified, offered a potential licensee to be the first company in a license area to produce and sell a new product substantially better, from a performance point of view, than galvanized sheet steel. The license committee proposed general terms for a license agreement, including:

1. A nonexclusive license under certain patents.
2. A tonnage royalty for a license under the patents.
3. A nonexclusive license to receive a disclosure and use of Bethlehem's technology.
4. A fee for the technology license plus a per diem fee for certain other services.
5. A provision keying the royalty and fee to an appropriate index to adjust for inflation, with 1973 as the base year for the index.

The committee also proposed that licensing activities first be initiated in Europe.

Setting Fee

The license committee spent considerable time developing both the patent royalty and the technology fee. It was recognized that any patent royalty or technology fee is an arbitrary figure. Each is a guesstimate on the part of a licensor of the value of its patents and its technology and assistance. It was further recognized that Bethlehem, like many large companies, is at times a licensor and at times a licensee. Consequently, the committee adopted what the members considered a reasonable royalty and a reasonable fee and, importantly, ones that were logically determined and defensible.

The proposed patent royalty took into consideration the fact that Bethlehem's patents afforded a licensee protection in its country for a unique alloy coated steel product that in most atmospheres had two to four times the life of galvanized steel having approximately the same coating thickness. Furthermore, at the time, the relative prices for aluminum and zinc permitted the patented aluminum-zinc coated sheet steel to be made at a lower cost than galvanized steel, particularly in the lighter gauges.

The proposed technology fee took into consideration a number of factors. It was based upon the time, effort, and expense that another company might require to develop similar technology. It was also based upon the value that would accrue to a licensee by receiving the technology in a complete and convenient package, plus the value of consultation services made available by Bethlehem during the time when the licensee's first line was being designed, engineered, and built, and during initial operations.

By May of 1973 six companies from five countries had expressed an interest in the Galvalume sheet developments. In early September, the Production Director of JLA, Stuart Fairbairn, wrote to Bethlehem and asked to learn more about Galvalume sheet as soon as possible and requested sufficient material "to determine whether a move to Galvalume was feasible for JLA as soon as possible." Spurred by JLA's obvious genuine interest, the license committee formulated and recommended a license program.

DEVELOPING A LICENSE PROGRAM

Based on information that had been developed, the license committee concluded that the best prospects for worldwide licensing were companies that already had one or more continuous hot-dip galvanizing lines in operation. The number of such lines then in existence in foreign countries in which Bethlehem had patents, by geographic locations, was as follows:

Canada (6)
Europe (48)
South Africa (5)
Pacific Basin (49)
 Australia (6)
 Japan (36 + 4 under construction)
 India (3)

It was decided that no consideration would be given to licensing in the United States until Bethlehem had first developed a market position for its new product. It was also decided to defer approaching companies in countries in which Bethlehem had no protection for its developments, e.g. South America. Taking all factors into consideration, the license committee made the following recommendations:

1. D.J. Blickwede should request management approval to license the Galvalume sheet developments.
2. Defer any licensing activity in Europe, which had been initially considered as a first target area, due to the uncertainty about licensing there because of the provisions of the Treaty of Rome and EEC regulations.
3. Initiate licensing activity in the Pacific Basin, i.e. Australia and Japan, where the potential was at least as great as in Europe.
4. Approach JLA first because:
   a. JLA appeared to have a genuine and strong interest in Galvalume sheet steel developments.
   b. Bethlehem and JLA had a long favorable relationship.
   c. Discussions with JLA personnel would be in the English language, a factor that would facilitate negotiations.
5. Thereafter, approach companies in Japan.
6. In approaching potential licensees adopt the following course of action:
   a. Send each prospective licensee company a letter describing Bethlehem's Galvalume sheet developments, enclosing descriptive brochures, asking for an indication of interest in the developments and stating that a Bethlehem licensing team, upon request, would arrange to visit the company in the near future.
   b. Have a licensing team visit each company expressing an interest to:
      - make a detailed presentation about Bethlehem's Galvalume sheet developments.
      - present terms for a license arrangement;
      - answer questions about the developments and the license arrangement.

LICENSE ACTIVITY

In October 1973 Dr. Blickwede received approval to proceed with a Galvalume sheet license program. He immediately cabled JLA of the approval and indicated a willingness to receive visitors. He described certain factors associated with the production and marketing of Galvalume sheet and recommended that JLA take them into consideration before sending any of its personnel to Bethlehem. Dr. Blickwede also offered to send a Bethlehem representative to JLA to amplify the production and marketing aspects of Galvalume sheet.

Interest in the Galvalume sheet developments increased. In November 1973 representatives of a Japanese company visited Bethlehem to learn more about the developments. JLA's Manager of Technology, Dr. L.G. Gore, visited Bethlehem and received a disclosure of non-proprietary information about Galvalume sheet and general terms for a license. He opined that the proposed terms appeared high and that JLA would have to receive considerably more information before entering into a license arrangement. He suggested that a broad disclosure of information be made to several of JLA's representatives under the provisions of a secrecy agreement that would also obligate JLA to pay a fee for the disclosure.

Disclosure

In December, JLA sent Bethlehem a letter suggesting deferral of any discussions about license terms until JLA received a more complete disclosure of information. Enclosed with the letter was a draft of agreement directed to a disclosure. Before 1973 ended several visitors from a South African company stopped at the research center to obtain information about Bethlehem's Galvalume sheet developments.

JLA's proposal for a more complete disclosure of information under a secrecy agreement caused Bethlehem personnel concern. There were doubts that a full disclosure should be made, if made how it would be done, and what the fee should be for a disclosure. Initially, Bethlehem personnel had assumed that there would be no requirement to make a full disclosure to a potential licensee. Committee members were of the opinion that a potential licensee could obtain samples of Galvalume sheet, test the material to determine whether or not it possessed the corrosion resistance characteristics claimed by Bethlehem, and decide if license discussions were desired. A potential licensee could have no doubts that Galvalume sheet was capable of being produced and marketed, by virtue of Bethlehem's having done so. Consequently, there was great reluctance to making a full disclosure of Bethlehem's technology. However, after encountering numerous questions from a number of potential licensees, Bethlehem personnel reluctantly recognized that without a more detailed disclosure of information than had been prevously made, it would be difficult to obtain a licensee in the near future under the terms proposed by Bethlehem.

Bethlehem agreed to the JLA proposal, and Bethlehem and JLA entered into a disclosure-evaluation agreement dated 28 February 1974 on terms similar to those proposed by JLA. Arrangements were made for a team of JLA people to receive a disclosure, and in preparation for the

the visit JLA sent Bethlehem a long list of questions that JLA personnel wished answered. In March 1974 a JLA team visited Bethlehem's research center and plant at Sparrows Point, Maryland, for five days. The team received a disclosure of:

2. Technical information related to the development and performance of Galvalume sheet.

2. Production information, including equipment details and operating practices.

3. Information about Bethlehem's issued patents and pending applications in Australia.

4. General terms for a license arrangement.

The team also visited several buildings with roofs of Galvalume sheet that had been in service for several years. Bethlehem personnel involved with the JLA visit were of the opinion that the JLA team was pleased with the manner in which the visit was conducted and the information obtained.

England

In April 1974 a steel company from England inquired about a license to produce Galvalume sheet and asked for a disclosure of technical and operating information. Bethlehem offered to disclose information on terms similar to those of the JLA agreement. While Bethlehem personnel were aware of difficulties that might arise with respect to licensing a company in the EEC, Bethlehem wished to avail itself of every opportunity to obtain, as soon as possible, as many licensees as possible.

At the end of May 1974, Bethlehem sent JLA drafts of a patent license agreement and a technology agreement, both nonexclusive. In June Bethlehem was informed that JLA's owners had approved consummation of a license and that the mechanics of an agreement would progress quickly. Further communications followed, including a cable of 14 June stating, "We are sure that we have an agreement in principle." We were not quite sure what JLA meant by "agreement in principle." Enclosed with a JLA letter dated 21 June 1974 was a formidable attachment, seven large papers, with specific references, questions and suggestions about 33 separate clauses of one or both of the agreements. Included among the suggestions was language that we interpreted as a request for an exclusive license. Bethlehem replied in detail to the letter and proposed that a meeting be arranged to finalize the agreements.

Even while negotiating by cable and mail with JLA, Bethlehem personnel proceeded with plans to approach steel companies in Japan. A letter describing Bethlehem's 55% aluminum-zinc coating developments and enclosing Galvalume sheet advertising brochures was sent to a dozen Japanese steel companies that each had two or more hot-dip galvanizing lines in operation. The letter concluded with a statement that a Bethlehem licensing team would soon travel to Japan and that the team would contact an appropriate office of the company to arrange for a visit during which additional information would be made available. Since the team would have to discuss both technical information about Galvalume sheet and terms for a license under Bethlehem's technology and patents in Japan, it was decided to send a two-man team. Dr. James Horton, one of the inventors of the aluminum-zinc alloy coated steel, and I, the Manager of Patents, were selected to promote the licensing in Japan.

Dr. Horton and I left for Japan on 23 August 1974 for a scheduled three-week visit. Since the JLA agreements had not been finalized prior to our departure, it was hoped that the trip would be extended to Australia so that negotiation of the agreements with JLA could be concluded. In contemplation of a possible visit to JLA, I maintained communications with my office and sent back instructions to redraft the JLA agreements to include certain JLA suggestions received just prior to my departure. However, on 30 August, while in Tokyo, I received a telex from Bethlehem which said, "No word from JLA. You should plan to return home on completion of business in Japan without going to Australia." Several days later Mr. Fairbairn sent Dr. Blickwede a cable confirming an agreement and requesting that I travel to Sydney to join with JLA's legal and technical people to produce an agreement. I was instructed to proceed to Sydney to meet with JLA personnel.

LICENSE NEGOTIATIONS

I arrived in Sydney on Thursday morning 12 September 1974 and after lunch began negotiations with JLA personnel. Upon my arrival I received a package from Bethlehem which contained drafts of the proposed agreements that had been revised to accommodate certain JLA suggestions. The most important revisions were made in response to JLA's request for an exclusive license arrangement. Another revision was the substitution, at JLA's request, of a United States price index for the Australian Consumer Price Index that had been included in the earlier drafts to make Bethlehem whole with respect to the erosion of payments that could occur in the event of subsequent inflation.

Bethlehem was pleased to grant JLA an exclusive arrangement but, naturally, wanted something in return. That something was a higher technology fee, a higher patent royalty, and an annual minimum royalty. The revised draft of technology agreement specified a fee, which was moderately higher than in the earlier drafts. The revised draft of patent license agreement left blank the royalty figures, both for the payment per ton of product produced and the total annual minimum amount which Bethlehm desired as compensation for an exclusive license arrangement. The reason for leaving both royalty figures blank, i.e. unspecified, was to promptly draw the attention of JLA personnel to those provisions, without stating higher figures which, in any event, would be attacked. Bethlehem had no objections to changing the payment index from an Australian index to a United States index.

As was anticipated, mention of the higher fee, higher royalty, and minimum royalty provisions provoked lively discussions. JLA personnel not only balked at all three proposals, they vigorously objected to having 1973 as the base year for the index applicable to payments. Their rationale was that the base year should be the year in which the agreements would be consummated, i.e. 1974. Their opinion was influenced by the substantial increase that had taken place in the index during the first eight months of 1974, which would escalate the payment by no small amount.

I argued that since the royalty and fee proposed by Bethlehem had been offered to JLA and others based upon 1973 dollars, the base year for the index should be

1973. I also reasoned that a minimum royalty provision was fair, since an exclusive license deprived Bethlehem of the opportunity to obtain another licensee in Australia and payment of a minimum royalty would not be required until 1976, the year that JLA first expected to produce aluminum-zinc coated sheet steel.

Review

Five days were spent reviewing, word by word, the language of both of the agreements, revising the language where necessary, adding new provisions, discarding others suggested, and resolving the troublesome fee, royalty, and index base year provisions, and others. As you may surmise, the troublesome provisions were resolved by compromise, taking into consideration all factors.

The matter of the higher technology fee was resolved by permitting payment on a tonnage basis as product was produced, rather than up front as a single payment. This gave Bethlehem the amount it desired, keyed to an index, and enabled JLA to defer payment until after production on a line had begun.

The higher patent royalty and index base-year problems were not easily solved. We explored increasing the tonnage royalty and changing the base year to 1974, making the royalty a percentage of the selling price so that no index would be necessary, and using a nonuniform sliding scale royalty schedule dependent upon sheet thickness. Each of these proposals was explored in depth and discarded. The compromise finally agreed upon was to have JLA pay the higher royalty for a specified number of tons produced in a calendar year, after which the royalty was reduced for any additional tons produced during the year.

The minimum annual royalty provision, which Bethlehem desired, was retained. However, the language was modified to permit JLA to terminate the agreement at any time after a specified total amount of royalties had been paid. Language was also added to relieve JLA of its obligations with respect to payment of the minimum total royalty in the event that JLA, after following all of Bethlehem's instructions and recommendations, abandoned the manufacture of aluminum-zinc coated sheet steel because the performance of the coated steel differed adversely in some significant aspect from that claimed by Bethlehem.

JLA personnel very reluctantly accepted 1973 as the base year for the index after their attention was directed to an analogous situation with respect to a hot strip mill JLA planned to build. JLA first obtained a quote for the mill in 1973 but deferred placing an order. In 1974 when JLA sought to place an order, the price had escalated substantially. Logically, if JLA, and others, had to accept escalation because of inflation in the prices paid for equipment, it would be unreasonable to object to escalation in fees and royalties to be paid during the life of agreements that would last for many years.

My emphasis upon the above problems that were resolved during the negotiations in Sydney should not be construed as minimizing other important matters that were agreed upon prior to and during the Sydney meetings. For example, considerable time and effort had been expended in arriving at definitions for the important words and phrases used in the agreements. Since the payment of fees and royalties was to be made for aluminum-zinc coated sheet products, a precise definition for "Licensed Products" was important and arrived at after much discussion. One of the most difficult questions faced by any license negotiators is the manner of dealing with improvements. The definition of "Improvements" was arrived at after a thorough and extended review, both by correspondence and during face to face meetings. The same was applicable for the other definitions.

Exclusive License

JLA was granted an exclusive license in Australia under the "Licensed Patents," i.e. three Australian patents and two applications, to make, use, and sell Licensed Products in Australia. JLA was granted an exclusive license to use "Technical Information," i.e. the information received principally under the disclosure agreement of 28 February 1974, to manufacture "Licensed Products" at JLA facilities in Australia and to use and sell the products. There were no restrictions on exports, but the patent agreement specifically stated that JLA was granted no rights under any Bethlehem patents in any country other than Australia. The agreements obligated each party for 10 years to disclose its "Improvements" to the other party. Each party was obligated to maintain secret for 10 years certain confidential information received from the other party and was permitted, upon request, to visit and observe the production of Licensed Products at the other parties' facilities. In addition the agreements contained other standard or "boiler-plate" provisions, including those applicable to records, payments, representations and warranties, most-favored licensee, force majeure, arbitration, etc.

I left Sydney on Thursday 19 September, one short week after my arrival. All of the major problems had been resolved and there remained only a few minor matters to be dealt with prior to submission of the agreements to the management of both JLA and Bethlehem for approval. The agreements, dated 18 October 1974, were executed by appropriate officers of both companies.

IMPLEMENTATION OF THE AGREEMENTS

Even before the agreements were executed, JLA requested assistance which Bethlehem was not specifically obligated to provide under the agreements. The first request was to prepare a technical paper for presentation in Sydney in December 1975 at the Sixth Annual Congress of Metallic Corrosion. The second request was for marketing assistance. Since the request to prepare a technical paper involved only Research personnel there was no problem, and Dr. Blickwede approved the paper. However, the second request involved marketing assistance from the Sales Department, which theretofore had not been directly involved in any of the license arrangements. Fortunately, Bethlehem personnel of all departments recognized that once the agreements were executed, it was in Bethlehem's best interest to provide all the reasonable assistance that JLA might request, and the marketing assistance was made available.

JLA shipped several hundred tons of various gauges and widths of steel sheet to Bethlehem's Sparrows Point plant, which processed the steel and applied a 55% aluminum-zinc alloy coating. The steel was returned to JLA and used for market development purposes.

Throughout the period during which JLA was engineering and converting a hot-dip galvanizing line to the production of aluminum-zinc coated sheet steel, JLA made numerous requests to Bethlehem for assistance, mainly of a technical nature. A favorable factor with respect to assistance provided by Bethlehem to JLA was that JLA's continuous hot-dip galvanizing lines were quite similar to Bethlehem's. In fact, JLA in the early 1960s had obtained assistance from Bethlehem in designing and operating JLA's hot-dip galvanizing lines.

During JLA's market development program a major problem arose that was different from any previously experienced by Bethlehem. JLA encountered a serious wet storage stain problem with aluminum-zinc coated sheet steel shipped to areas of extreme heat and humidity. Unfortunately, the stain on aluminum-zinc coated sheet steel is black and more objectionable than the white storage stain that occurs under similar conditions, with galvanized steel. JLA immediately requested Bethlehem's help and Bethlehem's Research people, after a great deal of work, were able to solve the problem.

In April 1976 at JLA's request, two Bethlehem people, Larry Caldwell from Research and John Connolly from the Sparrows Point plant, both very knowledgeable about the operation of aluminum-zinc sheet steel coating lines, assisted JLA, in starting its first aluminum-zinc sheet steel coating line. The start-up assistance, obligated by agreement, was in Bethlehem's best interests to insure that JLA produced quality products as early as possible. The start up, I understand, went extremely well and JLA was then in the business of manufacturing and selling aluminum-zinc coated sheet steel.

CONCLUSION

In the decades following World War II an increasing number of companies have become involved in technology transfer. Prior to 1970 Bethlehem had experience in many technology transfer arrangements, but the Galvalume sheet licensing program, which resulted in JLA becoming the first Bethlehem licensee, was Bethlehem's first successful experience as a licensor in a worldwide licensing endeavor. The program for Bethlehem personnel was an interesting, educational, and rewarding experience.

The attitude of Bethlehem personnel involved directly in the license program and the negotiations with JLA personnel was influenced by several considerations, including the following:

1. Any license arrangement must be mutually beneficial to the licensor and licensee.
2. The first licensee adds impetus and credibility to a license program; consequently.
3. A licensor may generally be more flexible during negotiations with a first licensee than with subsequent licensees.
4. Communications, even when both parties use the same language, is never easy and requires that all parties involved in negotiations exhibit patience and flexibility.

The negotiations between Bethlehem and JLA began in December 1973 with Bethlehem's proposal of general terms for an arrangement and continued for about 10 months, by cable, mail, and in face-to-face meetings. Communications, particularly by cable and mail, over a distance of 8,000 miles created many difficulties. There is a difference, which frequently required explanation, between Australian English and American English. The differences between the laws and patent practices in both countries required clarification. Notwithstanding the many difficulties, there was a genuine spirit of cooperation between the parties, from Dr Blickwede at Bethlehem and Mr. Fairbairn at JLA, and throughout their organizations, that contributed to the success of the negotiations.

Subsequent to the agreements with JLA, Bethlehem licensed its Galvalume sheet developments to licensees in Sweden and the European Economic Community. The licensing activities had been additional part-time responsibilities of certain research and patent personnel who also continued handling their normal work. Inevitably, conflicts with assignments arose and had to be resolved. The success of the Galvalume sheet license program and potential rewards of licensing contributed to the formation by Bethlehem of a subsidiary company, Bethlehem International Engineering Corporation (BIEC), which assumed responsibility for licensing Bethlehem's patents and technology and marketing technical services. BIEC has licensed the Galvalume sheet developments to companies in the United States, Canada, the United Kingdom, Japan, Korea, Spain, and Italy. Without a doubt, Bethlehem's Galvalume sheet licensing program has been a success.

In any successful program it's easy to find the heroes, i.e. those deserving credit. With respect to the Galvalume sheet developments, their commercialization, and licensing, those deserving credit are: Angelo Bozillo and Dr. James Horton, the inventors; Dr. D.J. Blickwede, then Vice-President-Research, who had the foresight and determination to support the developments, commercialization, and licensing; and the executives of Steel Operations and Sales, who committed the funds required for commercialization. However, there remains at least one unsung hero who deserves recognition.

Duffield Hoy, the patent agent who prepared and prosecuted the basic patent applications, did a superb job. If he had not done as well, there may have been inadequate patent protection or no protection for the aluminum-zinc coated product and its method of manufacture. Without patent protection there would have been no commercialization of Galvalume sheet and no licensing program.

There was also a hero at JLA. Someone at JLA had confidence in aluminum-zinc coated sheet steel and promoted a license arrangement with Bethlehem. The success of JLA's marketing and selling of aluminum-zinc alloy coated sheet steel in Australia was an important factor in the licensing of Bethlehem's aluminum-zinc coating developments to other licensees.

During negotiations in 1974 in Sydney I received three significant messages from Bethlehem. The first instructed me to watch out for flying boomerangs. I did. The second informed me that after four weeks' absence the O'Keefe family had advertised in the local paper for a new father and husband. Those of you who travel recognize the danger. The third message read: "Southern Cross needs Galvalume hull to win America's Cup." Southern Cross didn't win in 1974, but Australia II won the Cup last September. Possibly the true secret of the success of Australia II is that it has a hull that includes an aluminum-zinc alloy coating!

Following the successful Bethlehem-JLA negotiations I have become friends with many JLA people. One of them, who participated in the negotiations, always refers to the negotiations in the same way:

"You ___________. Six of us spent a week together in September 1974 negotiating the license agreements, and you were the only bloody bloke who knew what he was doing!"

I would be disappointed if the statement were true. Stuart Davis of JLA will now present the license arrangement from the licensee's viewpoint. You may then draw your own conclusion.