Before one can speak about the present "Quality Control in Structural Steel Fabrication," we must look at the history of our industry and why it is a topic today.

The testimony of the strength of steel and the fabricators ability to control quality are in evidence all around us. Millions of tons of steel in bridges and buildings which were fabricated, in some cases, two generations ago are giving service far beyond the designers dreams. This is partly a result of the design and the material used and the manner in which the majority of steel members were fastened, prior to 1955.

As we all know, A-7 was the structural material available and almost any steel in any fabricators yard was A-7. Riveting was the way in which material was held together and normal shop practices were developed in riveting shops all over America. As a matter of fact, the industry, from 1900 to 1940, stood still and a shopman placed in one shop or another knew exactly what to do and how to do it. There also was a pride in workmanship which, even though still exists, is not as prevalent as it used to be. Although the sledge hammer is still an important tool in our industry today, in many respects it was the tool through the first half of this century.

In the 1950's, welding began to influence the design and fabrication industry. The impact of welding, coupled with new steels such as A514, A588, A572 and others is still being felt in our industry. With welding and the new steels, new designs were possible which gave the owner more beauty in his structures at less cost. It also brought to the fabricator problems which were non-existent before. Welding is treated somewhat like hypnotism. We know it works, but we all don't know why. Consequently, we are all concerned about the welding of two pieces of material into one. When we all learned to understand and have faith in welding A7 or A36, along came A514 or 100,000 strength steel. A new learning period was required.

Into this boiling pot came the Interstate Highway System, and the governmental control which is not only natural, but necessary. In order to protect my tax dollar and yours, the government, through various state and federal agencies, decided to demand inspection and get what was being paid for. I submit that this has, in fact, not in itself created quality, but has created mountains of paper which says that quality is there.

What has the fabricator done over the past 10 years to help, not only himself, but to give the owner better quality? If he was smart, he got into quality control. We, as fabricators, are responsible for our product. In most cases, we are not responsible for design, but we are for workmanship in accordance with specification. Not everything in a fabricating shop is done as it is supposed to be done. Pieces are cut short, welds are made wrong, and perhaps dimensions aren't held. The important thing for the fabricator is to have the ability to find these areas and resolve them. Most dimensional problems can be worked out with adjoining members, poor quality welds can be replaced, and splices can be added.

I submit that many fabricators have come a long way in putting in motion the mechanics necessary to police themselves. However, we then found ourselves with delays resulting, not from errors being found, but in resolving how to correct them. Days may go by while sketches and letters are processed, and even summit meetings are held. Meanwhile, back at the ranch, money keeps being spent.

At this point, the American Institute of Steel Construction got involved and set up a committee entitled "Quality Criteria and Inspection Standards." The first two years, the Committee set up In-House seminars across the country, in order to alert, reinforce and make our own members understand the need for quality. From these seminars, feed-back occurred, indicating that there was an interpretation problem at the operating level between shop personnel and customer's inspectors or agents acting in behalf of the customer.

The Committee then started on the Quality Commentaries. These commentaries cover the various operations which take place in a fabricating shop i.e., there is a chapter on:

1. Preparation of Materials
2. Fitting and Fastening
3. Welding
4. Dimensional Tolerances
5. Surface Preparation and Painting

In each one of these areas, there are normal shop practices which have never been formally adopted as A.I.S.C. approved practice. The normal shop practice is explained and the reasons given for its use. Where this practice may lead to a conflict, the A.I.S.C. gives a recommendation for settling the difference. I don't feel specifics are necessary here, other than to state that terms such as:

1. "Smooth and Flush,
2. "Square," and
3. "Full Bearing"

have led to many arguments on the floor of the Shop. We discuss where we are in conflict or how we, as an industry, interpret various sections in A.W.S. or S.S.P.C. For example, under S.S.P.C., the interpretation of Commercial #6 vs. Near White #10 blast cleaning.

The commentaries are complete and have been issued to all member firms of the A.I.S.C. They are in use now. This month the A.I.S.C. will issue a general bulletin advising our mailing list of their existence and availability at A.I.S.C. headquarters in New York.
The fabrication process will tell you whether they have that plate is what it is supposed to be, rests with the management and in their subordinates and men. It is obvious that the involvement of the A.I.S.C. in this area has led to Quality at the shop level in most plants today.

If one entered our plant at Hammond, Indiana he would find the following:

1. A Welding Engineer
2. A Welding Foreman
3. A Quality Control Supervisor
4. In-house X-Ray equipment
5. In-house Ultrasonic equipment
6. Three qualified U.T. Inspectors
7. 2 Magnetic Particle Inspectors and the equipment
8. 3 Dimensional Inspectors

On every job of large size, we write a separate Quality Control manual, stating in many cases dimensional criteria in excess of the specifications. The booklet lists the various types of non-destructive testing which will take place and the paper work which will be used to record and give evidence that it was, in fact, done.

Let's talk about a term which does not seem to have a place in our computerized, large company, big union, federal government world. Many of the efforts, particularly those of the Federal Government, gives one a feeling of a slight lack of trust. We are suppliers and most of us have a history of satisfactory performance. Those that haven't given a proper product or service aren't with us have a history of satisfactory performance. Those that haven't, in years past, needed. It is obvious that the involvement of the A.I.S.C. in this area has led to Quality at the shop level in most plants today.

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then I have not done the job I set out to do. The answer to stopping a riot may lie in more police and the answer to poor quality may lie in more inspectors, but we must know we are treating symptoms, not causes. The American Institute has gone to the causes of quality and has launched a program which, over a period of time, will enable it to become the recognized authority in matters of Quality Criteria and Inspection Standards.