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THE FRAGILITY OF FUNCTIONAL WORK SYSTEMS IN AMERICAN
STEEL

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Abstract

The I/N case offers insight into the interrelationship between work systems, living standards and performance. It demonstrates that a high road approach and functional work systems positively impact stakeholders' lives, improve production efficiency and benefit the local and macro-level economies and societies in which they are embedded. It also shows that such work systems can be implemented in contexts with a history of adversarial labor-management relations. However, broader external forces can conspire to make it very difficult for firms to sustain functional work systems despite initial successes in specific contexts. Financial markets in particular make long term commitment to stakeholder groups other than shareholders (i.e. employees, suppliers and communities) conditional on profit maximization and share price appreciation. Yet the logic of profit maximization for the benefit of shareholders leads to short termist decisions that undermine the very commitments that were so necessary for creating a new work system: security is threatened, training is put on the back burner; trust is irreparably undermined. Indeed, because of the inherent contradiction between strategic approaches to maximizing stock market and long term product market success, these high road systems are fragile in national frameworks that subject them to low road pressures without a forum for resolving the difficulties that arise from opposing market pressures and responses.

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THE FRAGILITY OF FUNCTIONAL WORK SYSTEMS IN AMERICAN STEEL

1. Introduction

The U.S. steel industry has experienced profound change during the past three decades. Shifting market and technology conditions and public policies have provided both opportunities and constraints that have shaped and re-shaped the environment in which steel producers operate and to which they must respond. In the United States, pressures from intensified domestic and international competition, rapid and labor-saving technological advances, market deregulation and increasing globalization of corporate steel assets have put even the most competitive domestically based steel producers under mounting pressure to continually cut costs and increase efficiency. As a result, American steel producers have increasingly sought alliances with foreign steel firms because of the performance benefits associated with access to foreign technology and financial resources, global steel sourcing and distribution channels, and expanded market share.

It is within the context of an increasingly global steel industry that the nature of the firm's work system as a strategy for strengthening performance has attracted attention in academia and in industry. There is now widespread agreement that cooperation among productive agents, and the implementation of high performance or *functional* work systems¹ substantively benefits product quality, production efficiency, financial returns and organizational responsiveness (Wilkinson 1998; Konzelmann and Birecree 1998; Konzelmann 1996; Appelbaum and Batt 1994; Delaney, Ichniowski and Lewin 1988; Kochan, Katz and McKersie 1986). "Functional" work systems embody cooperative labor relations and innovative work structures, management methods and human resource practices. They positively impact the firm's long run viability by empowering productive agents with control over the production and decision-making processes that affect their working lives. They also benefit the broader economic

system by providing stable employment and incomes and relatively high levels of general and specific training. In contrast, *dysfunctional* work systems feature traditional management and human resources practices, relatively adversarial labor relations, little employment and income security, and minimal emphasis on training.

Despite the long-term competitive advantages attributed to them, functional work systems may be difficult to sustain in the U.S. Although there are cases where such systems have been successfully implemented in the short run, they remain vulnerable in the medium run (five to ten years), particularly in cases where external or corporate-level pressures and strategic choices subordinate local to corporate-level interests. Given the easily measured costs of such systems, the difficulty of measuring the long run benefits, and the importance of *sustained* commitment to employees in the form of increased training, security and autonomy, these new work cultures are fragile in the U.S. environment. U.S. financial markets reward managers and decision-makers for focusing on short-term profitability in the interest of shareholders; and managers who do not boost share price eventually face replacement or takeovers. These management disruptions and ownership changes can quickly lead to reversion to more traditional approaches to labor relations and work organization. Key work system components (i.e. employment security, innovative incentive plans, training, and other investments in hard-to-measure intangibles) are often viewed by new decision-makers/owners as unnecessarily expensive and/or vague. Changes of this nature at the strategic decision making level undermine morale and trust among employees, contributing to the work system's eventual deterioration back into a more dysfunctional form.

This paper analyzes the experience of a highly successful work system in the American steel industry that survived and flourished in the 1990's, but is currently under stress from the changes that have resulted from the corporate buy-out of its American parent. I/N Tek / I/N Kote (I/N) are highly efficient and profitable greenfield steel

processing plants that were jointly financed and built (1987-1990) by American-owned Inland Steel Company and Japanese-owned Nippon Steel Corporation. Despite profitable performance, in 1998, in a quickly negotiated sale, Inland Steel Company sold itself (and its ownership share in I/N) to ISPAT International, a Dutch-owned global steel conglomerate. The buy-out came as a surprise to many of the firm's stakeholders, including Nippon Steel and employees at I/N. The resulting change in ownership and management objectives is now putting the I/N work system under significant stress, and threatening the high labor standards and quality of life it has supported.

Section one surveys the literature on functional work systems and their interrelationship with firm performance. Section two analyzes three phases in I/N's history: pre-start-up and start-up; the attempt to sustain, improve and draw lessons from its initially functional work system; and subsequent responses to pressures for change generated by the 1998 ownership shift to ISPAT. Using the productive systems framework for analysis (Wilkinson, 1998; Wilkinson, 1983), it traces the inter-linkages between the technical and social relations of production and the impacts of strategic responses to pressures operating on the productive system. Section three draws conclusions from the previous discussion and highlights the policy implications that emerge from the analysis.

2. Functional Work Systems

During the past two decades, inspired by the apparent success of Japanese work and production systems, many U.S. firms have been experimenting with new forms of work organization. These work system experiments typically involve some combination of quality circles, employee participation in decision-making (both on- and off-line), teamwork, continuous improvement, training, employment security, flattening of hierarchy, and gain or profit sharing schemes. In the American industrial relations and management literature, most studies find that new workplace techniques (often referred to as "high

performance work practices”) generate substantive productivity and quality gains for manufacturers implementing them (Appelbaum and Batt, 1994; Ichniowski, Kochan, Levine, Olson, and Straus, 1996; Ichniowski, Shaw, and Prennushi, 1997; Black and Lynch, 1998; Pfeffer, 1998). Additionally, studies focusing explicitly on financial returns have found that new work systems generate results that are equal or superior to those associated with more traditional work systems (Huselid, 1995; Baker, 1999).

Given empirical evidence of their relative efficiency, one would expect these new workplace techniques to quickly dominate in American firms. However, radical and sustained organizational transformation is challenging in the U.S. context. Even those firms that succeed in planning and implementing functional work systems find that sustaining them over the longer term is difficult. To date, studies suggest that diffusion of these practices is slower and less extensive than one would expect, and the medium and long-run survival of even the most promising new workplace techniques is far from guaranteed (Osterman 1994; Pfeffer 1996; Doeringer, EvansKlock, and Terkla 1998).

To explain this slow diffusion, fragility, and variation in success (and failure) rates of new workplace practices, research formerly restricted to workplace innovation is broadening its scope. Many studies now suggest that systemic reform of the entire *employee relations system*, rather than implementation of new work place practices alone, is critical. Mutual cooperation and trust among managers and employees are considered necessary but not sufficient conditions for successful systemic reform and institutionalization of the work system, and the importance of *how* - rather than *whether* - change is implemented is a recurrent theme in the literature (Cooke 1989; Ichniowski et al. 1996; Birecree and Konzelmann 1997; Wagar 1997; Lopez et al. 1997; Pfeffer 1998). Many studies also find that unions *increase* the likelihood that functional work systems will be efficient and long

lasting because they help to ensure substantive employee authority in any change process (Black and Lynch 1997).

The institutional context in which a firm attempts reform is also important because systemic workplace reform does not occur in vacuum; the firm's broader institutional environment profoundly affects the process (Levine and Tyson 1990; Brown and Reich 1997). Capital, product and labor markets play a significant role in either shaping and encouraging or discouraging reform internal to the firm. It is therefore significant that in the United States, many new workplace techniques are imported pieces of models developed in other institutional contexts.

Appelbaum and Batt (1994) argue that U.S. managers approach the transformation of work in an ad hoc manner because national institutions do not support functional work systems:

"Managers in the U.S. turn to consultants and come under the influence of one guru or another. Thus, U.S. companies often import pieces of production models, sociotechnical systems, lean production, diversity quality production, or flexible specialization, that were developed in other institutional contexts. Such models may be implemented successfully in one or another company without the support of external institutions, but it takes a leadership dedicated to change and a very large commitment of financial and other corporate resources to make widespread organizational change possible." (p. 157)

Without external support, firms must *independently* determine the best way to transform their work-place environment. Because functional work systems are expensive in the short run and require sustained effort, commitment, and training of everyone involved, their success is often *dependent* on particular personalities with an expressed commitment to such approaches. In short, the absence of an external institutional imperative that socializes some of the costs of functional

work systems means that it may not be profitable in the short run for firms to introduce and/ or to maintain more efficient modes of work.

The U.S. financial environment is particularly short termist. American managers and strategic decision-makers are under intense pressure to cut costs in the short run for the benefit of largely absentee shareholders. Therefore, instead of encouraging or being indifferent to the nature of the firm's work system, the U.S. financial system operates as a *constraint* on the diffusion and maintenance of functional work practices. By rewarding short run profitability, it undermines the ability of shareholders to act as patient investors, willing to see expensive projects through. It reduces the ability of managers to invest in research and development, new process technology, and training required for new work practices to be effective; and it can undermine the ability of firms to undertake long term employment contracts with hourly and managerial employees (Lazonick 1992). It also facilitates rapid, often unexpected changes in ownership without concern for other stakeholders' approval, leading to erosion of trust and morale among employees. Pfeffer (1996) explains:

"The power of the capital markets and institutional investors now virtually dictates that firms focus on financial issues. Unfortunately, the quickest way for a firm to raise its stock price, at least in the comparatively short term, is by announcing layoffs. Thus, financially oriented firms have little reason to be very sensitive to high performance work practices.

The financial viewpoint sees other negatives. High performance work practices require major up-front investments: training, more selective (and hence more expensive) recruiting, perhaps higher wages, and so forth. The payoff from these investments is obviously uncertain and, in any event, follows with considerable lag. Risk aversion would lead many managers to eschew a

performance improvement strategy with this much uncertainty and delay.

The positive effects on profits from cutting costs are visible on the typical spreadsheet program. Not so gains in quality and productivity emerging from an interrelated set of changes in how people are managed. Moreover, typical organizational accounting systems enter training, wages, and expenditures on organizational change efforts as expenses-without corresponding returns that can be measured by typical means. The temptation to cut these costs under the least financial stringency is almost overwhelming." (Pfeffer 1996: p 34)

Faced with these kinds of pressures, it is easy to understand why firms find it very difficult to implement and sustain functional work systems in the U.S. context.

Significantly, however, certain organizations based in the U.S. have managed to implement functional work systems that have survived for at least the short run. As these organizations attempt to maintain the successes of initial workplace reform during the medium and longer term, many important questions arise that are not yet adequately addressed in the literature. Among these are the following:

- 1) How do these organizations implement and then attempt to institutionalize functional work systems in the U.S.?
- 2) To what extent and how do organizations manage to insulate themselves from their external environment?
- 3) What kinds of pressures are these organizations really subject to?
- 4) How do they perform when the system comes under significant external stress?

To investigate these questions, longitudinal case studies of small and medium sized organizations at the plant level within particular industries are needed. As such, the case of I/N is instructive.

3. Description of the Case

3.1. Industry context: the American steel industry

Since the 1970s, the American steel industry has experienced a series of economic and industry crises; and its responses have generated substantial changes in industry and firm-level institutional and organizational structures. The uncontested world leader during the first half of this century, the United States is currently the third largest steel producing country, behind the People's Republic of China and Japan, each of which produces approximately 100 million tons of crude steel per year.

Traditionally, the American integrated steel producers² operated as an oligopoly, with domestic market control and unmatched economic and technological strength in world markets. In 1950, almost half of the world's steel was produced in the United States, compared with 12 percent in 1997 (AISI, various years). Contributing to this success was the superiority of U.S. steel production and productivity in world markets in a context of steadily increasing demand for steel. Since that time, however, declining demand for integrated steel products in an environment of intensifying competition from domestic and foreign steel producers has eroded the relative position of the U.S. steel oligopoly. By the late 1970s, American steel firms found themselves in an increasingly difficult economic and financial position, resulting in low operating rates, large financial losses, bankruptcies, massive plant closures and employment reductions.

During the 1980s and 1990s, American steel firms reacted in a variety of ways to the crisis. Some, like U.S. Steel Corporation, diversified corporate assets outside of the steel industry; others, like Bethlehem

Steel Corporation, focused corporate attention on domestic steel production activities; still others, like National Steel Corporation and Inland Steel Company, entered into joint ventures and joint ownership arrangements with foreign steel producers. As a whole, the American steel industry eliminated more than 40 million tons of capacity (40 %) during the 1980s and reduced employment by more than 250,000 employees (60 %) (AISI, various years). By the 1990s, the structure of the American steel industry had changed. The integrated steel sector had lost approximately one third of its share of domestic steel production to the mini-mill sector while imports rose from one percent of domestic steel supply in 1950 to 25 percent in 1997 (AISI, various years).

By the mid 1990s, after two decades of restructuring, American steel producers were again among the world's most productive, recording solid profits from 1994 onward. Because of the industry's relative maturity and its poor overall performance during the 1980s and early 1990s, however, steel stock prices remained depressed in one of the strongest stock markets in history. This put pressure on domestic steel producers to find ways to bolster stock market performance. The dominant response has been consolidation, mergers and acquisitions by which steel companies are becoming global productive systems. Globalization is accelerating cost competition in the industry as firms secure access to international sourcing and distribution channels permitting minimization of raw materials, production and distribution costs while at the same time dramatically expanding market share. In order to effectively compete in the global steel industry of the late 1990s, American steel companies have also been segmenting operations within the firm itself. Inland Steel Company provides a good example.

3.2. Corporate context: Inland Steel Company

In many respects, Inland Steel Company was a success story. Created in 1893, Inland soon gained a reputation for being among the best

managed and technologically sophisticated of the major US steel companies. The fourth largest US steel producer, its financial performance historically exceeded that of the rest of the industry, with annual sales in excess of \$2 billion (1.25 billion pounds).

In 1982, when the US steel industry was in deep crisis, Inland recorded its first economic losses in fifty years; and like many other US steel producers, its first response was to cut costs, reduce capacity, layoff people and delay capital expenditures. Despite these efforts, Inland continued to suffer extreme financial difficulties, recording losses of \$178.4 million (111.5 million pounds) in 1985. It was in this context that a new CEO, Frank Luerssen, took over and the company began to explore alternatives for corporate restructuring and for revitalizing productive operations. In 1984 and 1985, Inland sold off its non-steel assets, laid off thousands of employees and redirected production to the higher profit, high quality carbon steel segments of the market.

The results of these efforts ultimately gave rise to the diversity which now characterizes the company in the form of three operating divisions: The Inland Steel Flat Products Company, The Inland Steel Bar Company and I/N Tek and I/N Kote (I/N). The Inland Steel flat Products Company and the Inland Steel Bar Company are both located at the Indiana Harbor Works. They are separate business units but share the same USWA union local and management as well as an historical legacy of oligopoly company structure and behavior; rigid and fragmented internal labor market structures; and adversarial relationships between labor and management. The Inland Steel Flat Products Company is a modified, but largely traditional steel making facility. The Inland Steel Bar Company represents an effort to depart from tradition and create a hybrid facility which resembles a progressive mini-mill or specialty steel making facility within the walls of an integrated steelworks.

In sharp contrast to the other two divisions, the I/N facility is located in New Carlisle, IN. A joint venture between Inland and Japan's Nippon Steel Corporation, it is an autonomous, state-of-the-art greenfield steel processing plant. I/N has its own USWA local union and radically different organizational and internal labor market structures than its parent, although both management and the core labor force were transferred directly from the Indiana Harbor Works. Unique in its achievement of a progressive internal labor market system, the I/N case is instructive for purposes of understanding the creation and the attempt at institutionalization of a functional work system in a small organization which is tightly linked to a large steel corporation in the U.S. It is also interesting because it now must respond to the stresses of a corporate buy-out and radical change in corporate-level strategic and managerial decision-making processes. Its responses and the outcomes associated with this process will be important indicators of the ability of functional work systems to survive in the context of the unregulated U.S. economic, financial and industrial system. Appendix I provides further information about the Indiana Harbor Works Facilities. The I/N case is described below.

3.3. The new Carlisle facility: I/N Tek / I/N Kote

3.3.1. Planning and startup

I/N Tek was born out of corporate performance difficulties and Luersson's determination to turn Inland around. During the early 1980s, Inland Steel Company announced plans to explore the possibility of constructing a cold-rolling steel processing facility. In 1983, Luersson consulted with Japanese-owned Nippon Steel Corporation, the world's largest steel-maker, whose Hirohata facility added a new continuous cold mill in 1982, produced steel coils of extraordinary dimensions, surface quality and drawability, at a speed matched by no other plant in the world. The Hirohata plant was able to produce in one hour what could be produced in no less than twelve days at the Indiana Harbor Works. Inland decided to try to transplant

this technology to its facilities in the U.S. However, Inland's poor corporate performance in a context of industry crisis translated into insufficient internal funding and difficulties in obtaining domestic financing. The venture therefore depended on partnership with another company.

In the spring of 1985, Luerssen approached Nippon and proposed forming a joint venture using the Japanese technology employed at the Hirohata facility. Initially not interested, by summer, Nippon faced over-capacity in the Japanese domestic steel market and pressure from Japanese automobile transplants in the United States that were unable to obtain steel of requisite quality in the United States. Importing steel from Japan was both expensive and difficult; and it was exacerbating trade tensions between the two countries. Nippon therefore became interested in a joint venture that would allow it to produce steel in the United States, thereby avoiding trade restrictions and tensions. Because Nippon had maintained a long, informal relationship with Inland, and respected Inland's corporate commitment to the steel industry, it made sense for the two companies to collaborate. In the end, Nippon agreed to arrange project financing that would not appear on Inland's balance sheet, and to accept the Tek joint venture facility as collateral for the debt. The bulk of the initial I/N Tek cost (\$525 million (328.125 million pounds)) was provided by three Japanese trading companies. In 1987, the agreement to build Tek (a 60% Inland/ 40% Nippon joint venture) was signed; and the mill was on-line by 1989. The agreement to build Kote (a 50% Inland / 50% Nippon) was signed in 1989; and the mill was ready for production in 1991. Nippon also became the largest shareholder of Inland in the early 1990s, representing a 13 percent stake in the firm.

3.3.2. The technical relations of production

Tek is a cold rolling mill with an annual capacity of 1 million tons which processes hot band steel coil produced at the Indiana Harbor Works. It serves customers in the automobile, appliance and office

furniture industries, most of whom are located in the mid-western United States. Modeled after the Hirohata facility in Japan, Tek's technology involves a continuous cold rolling process which integrates previously discontinuous batch processes (requiring approximately 12 days from start to finish) into a continuous flow process that takes less than 20 minutes per coil. Hot band produced at the Indiana Harbor Works is transported to Tek on railroad flat cars on a just-in-time basis (two days' supply is stored at the I/N facility on railroad flat cars). Coils are unloaded directly into the plant, unrolled and welded to the preceding coil. In a continuous process, the coil is prepared for cold reduction (pickled or de-scaled) before entering the continuous annealing process line (CAPL). It is then subject to processing in the skin pass mill before being inspected, sheared and recoiled. After this, automatic guided vehicles transport the coils for final finishing, wrapping and deposit in Tek's automatic storage and retrieval facility for truck or rail delivery to the customer.

Kote operates electrolytic and hot dipped galvanizing lines. It galvanizes and coats steel supplied by Tek as well as fully annealed coils supplied by the Indiana Harbor Works. With an annual capacity of 900,000 tons, Kote supplies customers almost exclusively in the automobile industry, its major customers are the Japanese automobile transplants and GM, Ford and Chrysler. Coils enter one of two continuous hot dip zinc coating lines. After galvanizing, coils are inspected, side trimmed, packaged and transferred to Kote's automatic retrieval facility by automatic guided vehicles.

At both Tek and Kote, the production process technology is entirely computer controlled. Employees are especially critical when there are problems. According to I/N President, John Selky,

“The automation technology provides for the operation to run absolutely wonderfully when everything is going well. However, workers and their special skills are key when something does not go the way you want it to go. The operators

and maintenance personnel work together to proactively avoid problems. But when things go wrong, teamwork, training and employee authority to make decisions on the line are critical for getting the line quickly running again' (personal interview, 4 December, 1998).

When things go wrong, teamwork, training, and employee authority to make decisions on the line are critical for getting the line quickly running again.

Because of the nature of the new, continuous process technology at I/N, workers are responsible for the entire process of production. Compared with I/N's predecessor in the Indiana Harbor Works, they therefore required new and different skills, greater job flexibility, and the willingness and ability to assume responsibility for both production and maintenance functions. This represented a radical departure from the traditional steel industry labor market system which typically reduced the task composition of various jobs into their narrowest component parts and assigned control over the labor and production process to management (see Appendix 2).

3.3.3. The social relations of production

While Tek and Kote share location, top management and union representation, prior to the 1998 ISPAT buy-out, each plant had its own vice president of operations, manager of technology and engineering; and Tek also had managers of sales and administration. Nippon supplied to Tek and Kote the vice president of operations and manager of technology; and to Kote the managers of sales administration and of customer service. Because Inland supplied the steel that was finished at I/N, Nippon also provided a quality control person at the Indiana Harbor Works to assure that the steel supplied to I/N was of the necessary quality. Besides the vice presidents and managers, Tek had a team of four Nippon engineers while Kote had ten Japanese technical personnel. All other employees were American.

The decision to locate the I/N facility in New Carlisle, Indiana, rather than at Indiana Harbor works, represented the first step in an effort to create a culture at the plant that was very different from the traditional steel industry culture. However, both management and workers were hired from a pool of employees that had worked at Indiana Harbor. I/N therefore represents a case where workers and managers from a brown-field site, with a traditional “Taylorist” work system, were imported to a new, green-field site, which by design would employ a highly participatory and non-adversarial work system.

3.3.3.1. Selection and hiring

Whereas Inland Steel had an elaborate seniority and skill based bidding system, the selection process at Tek and Kote was based on cooperation. According to Human Resource representatives, “We didn’t want Rambo types, even if they were super qualified and could run the world by themselves” (Magnum, Kim and Tallman, 1996). The applicant pool came from all areas of the Indiana Harbor Works, including the blast furnace, coke oven, open hearth and other departments. It also included New Carlisle locals without prior experience working in the steel industry.

The hiring process for the early workforce members was conducted by an outside consultant and an I/N management team. Later, as additional employees were required, bargaining unit members were included in the decision-making process. Displaced Inland employees were urged to apply but were not given any ‘special’ consideration; and everyone was required to go through the same selection process if they were interested in working in the new facility. Job applicants were subjected to a battery of tests conducted by the State of Indiana, including general aptitude tests and motivation tests, and a role playing exercise to assess their capacity for working in groups and being flexible. Each candidate was then interviewed by three separate interviewers who focused on strengths and weaknesses that were

revealed in the previous steps of the selection process. Out of the initial pool of over 1200 applicants, approximately 135 were successful. Of those final 135 applicants, 120 opted to accept the position.

The final 120 employees proved to be not just from the cold mill shutting down at Inland, but from many different plants at the Harbor Works. This in itself represents a departure from traditional hiring practices; in the past, most employees would have come from the former cold mill. Employees were also varied in age and experience, and seniority played a relatively minor role in determining who was selected. Because the union was satisfied that the Harbor Works employees were getting the first chance at the jobs in New Carlisle, they allowed more latitude for who out of the pool would be hired. The union also saw the logic of hiring locally for unskilled positions at the plant.

3.3.3.2. Pre-production training

During the year prior to start-up, I/N employed many unorthodox methods in order to encourage a smooth start-up. Production and maintenance workers and managers were put on salaried payroll and over 80 percent were sent to Japan. The objective was to provide technical training on the equipment and to allow I/N employees to see that the continuous process technology being installed in New Carlisle worked well in Japan. It also provided I/N employees with insight into the cooperative relationship between management and labor at the Hirohata Works (Tek) and at the Nagoya Works (Kote) and into aspects of the Japanese work culture (including the performance based bonus system, which is shared by all plant employees, the work structure, and the long-term view of the production relationship). Following this training in Japan, a training team from the Hirohata and Nagoya Works spent six months at Tek and Kote, respectively, to continue the technology training through the initial start-up phases of operation. While technical training was critical it was also necessary

to have all employees participate in the ‘new work culture’ training that was begun as soon as employees joined the company and continued informally for three to five years.

3.3.3.3. Employment security

Employment security is another key component of the I/N work system, guaranteed for the core organized labor force (the operators and craft maintenance workers). Protected employees could be bumped down to perform lower level material handler jobs, but without loss in pay from their previous positions. Employment security was particularly important for supporting the creation of the I/N work system in an industry context with a legacy of layoffs and increasingly unstable employment relations. It reduces risks associated with a participative labor market system and improves possibilities for labor/management cooperation, teamwork, and flexible job behavior. It also demonstrates the company’s commitment to its organized labor force. It is important to note, however, that while explicit employment security is provided to the majority of bargaining unit employees, it is not guaranteed for white-collar employees. Therefore, as long as the system performs to expectations, all employees are secure.

3.3.3.4. Work organization and culture

At I/N, teamwork, shared responsibility, broadly defined jobs and few job classifications characterize the organization of work. Unrestricted promotion is combined with employment security for the core labor force. Workers are cross-trained, multi-skilled, multi-craft workers. Although assigned a skill-based classification, operators normally perform preventive and corrective maintenance on the equipment they operate; and craft maintenance workers run the equipment they maintain. Work is organized into three basic areas: production (“operating attendant”), craft/maintenance (“process instrumentation”,

“process mechanic” and “process electrician”), and entry (“material handler”).

Within this structure, promotion ladders are flat and based on training, knowledge and skill. There are six skill levels for operators, five for maintenance workers and three for material handlers. Promotion to fully qualified status (and hence maximum earnings potential) is not impeded by the structure of career ladders and availability of openings higher-up. Every employee is expected to advance to fully qualified status. This serves to reduce class distinctions and barriers by permitting and encouraging each employee to reach his or her maximum potential. Initially, promotion was largely tenure-based; however, as the system matured, promotion based on skill and knowledge became the norm. Material handlers can progress to operator positions as openings become available. However, though theoretically possible, material handlers and operators rarely progress to craft maintenance positions which require specific skills.

3.3.3.5. Decision-making

Every level of decision-making at I/N involves input from a blend of bargaining unit and management personnel, from the shop floor teams to the Joint Advisory Council (JAC). Decisions are made by consensus, meaning that each worker and manager present their ideas and suggestions which carry equal weight in joint decision-making. Provision of information linking individual with organizational performance facilitates the union of common fulfilment of interests and objectives of all participants in productive operations, whether they be labor, management or staff, and helps to promote labor/management cooperation and teamwork. It also fosters commitment to the organization. By providing vehicles for self-expression and involvement in various aspects of the business, it promotes internal communication and resolution of problems as they arise.

According to I/N's retired president, John Selky, a critical component of the I/N work system involves employee authority to make decisions affecting I/N's daily operations, reinforced by other institutional supports:

“You must give people accountability and responsibility to do their job at the level they're at whether they are an engineer or a blue collar worker. And then, you must have other systems to support it. You have to have the security system support it and have the incentive pay system support it” (personal interview, 4 December 1999).

The degree of autonomy afforded bargaining unit production employees over production decisions is significant. There are no white collar employees and managers present during second and third shift or on the week-ends. Sixteen of the twenty one shifts are managed by the workforce without supervision, although employees can always consult engineers and other resources by phone. Reflecting on the degree of autonomy and hinting at the feeling that this is changing under new ownership, one bargaining unit team member said: “It felt like a career, not a job.....We ran the plant.” (Personal interview, 21 September 1998). This particular employee had worked at Inland for many years prior to working at Tek and Kote, and was profoundly energized by the transition to a new form of work stressing employee input and autonomy: “For me, it was always what I thought work should be about.” (Personal interview, 19 October 1998).

3.3.3.6. Team working

At I/N, responsibility and control over the entire process is assigned to self-directed autonomous work teams which share responsibility with management for the production process, training and the acquisition of necessary skills. Team assignments are made by teams and based on knowledge, skill and minimization of disruption. At I/N, teams are

responsible for products from beginning to end of the process. At Tek, because there is one basic product that varies in specifications, fabricated in a continuous process, the team consists of all 30 people operating each shift. Because this size is large, there has been continuing experimentation with alternative methods of coordinating work and team performance. At Kote, the two galvanizing lines are run by teams of seven to eight persons each, on each work shift.

3.3.3.7. Training

Training at I/N is influenced by the Japanese philosophy that “training is a way of life and a daily part of every job” (Magnum, Kim and Tallman 1996: 14). The Japanese term “kaizen” (continuous improvement) is well known to plant members. All training is on company time. I/N employees receive technical training as well as intensive training in math, chemistry and computer programming. All employees start at the bottom and advance through a process of skill by skill certification. Employees are also trained in social skills including teamwork, team building dispute resolution and communication, with teams scheduled off the line at least one day per month for team building activities at Kote (but not at Tek); and this was soon reduced to four hours.

In short, broad and extensive training in technical and computer skills, coupled with training in social and business skills, equip workers with the knowledge necessary for assuming responsibility beyond the technical requirements of their jobs. Such training also provides the labor force with transferable skills and expertise which are marketable in the external labor market, lowering the personal risks associated with a new labor market system like I/N’s and consequently improving the likelihood of effective internal labor market cooperation and flexible job behavior.

The training culture permeates the I/N work system from top to bottom. According to Selky and ex-financial controller and CFO Freeland:

“You have the responsibility to let them know what their job entails. I think that’s the crux of the whole thing. You have to be able to say: these are the people we invest in; and before we turn the first machine on, the first motor on, we invested a lot of money in these folks up-front. As you invest in them, let them know that you’re investing in them.” (Selky, personal interview, 4 December 1998).

I think the key is being a perpetual, professional student. You have to have a work force that is continually learning and continually training....this is the key to managing change and to success. We did an unbelievable amount of training. We brought the core group in a year before we even started up – for no other purpose than training and developing our unique culture. They certainly weren’t adding any “value” at that point, because they weren’t producing any products.” (Freeland, personal interview 15 December 1998).

3.3.3.8. Compensation

The compensation system, too, was designed to more closely unite labor and management. The compensation structure is a pay for knowledge system where workers progress from one skill-based classification to the next based on a series of training steps, defined by skill classification levels. During the first year of training, before the plant started operation, all employees at I/N were paid on a salary basis every two weeks. Currently (1998), all workers are guaranteed a 40 hour week, with wages for material handlers ranging from \$9.92 to \$12.15 per hour (three skill compensation levels) (6.20 to 7.60 pounds). Operators’ wages range from \$14.37 to \$17.16 per hour (six skill compensation levels) (8.98 to 10.73 pounds); and maintenance

employees' (process mechanics, process electricians and process instrumentation) wages range from \$14.94 to \$17.16 per hour (five skill compensation levels) (9.34 to 10.73 pounds). (Agreement between I/N Tek and I/N Kote and USWA, 29 September 1996). Annual income levels are high by local and industry standards because of a high performance based incentive plan. On average, Tek/Kote bargaining unit members earn over \$60,000 (37,500 pounds) annually (including bonuses). Performance bonuses are based on operating level (operating hours/scheduled hours); quality (rejections/output; customer complaints/output); efficiency (tons per hour/target or theoretical tons per hour); cost (defined by the JAC)). Quarterly bonuses are equally shared by all employees regardless of position in the hourly work-force and are based largely on measures of output and quality. Early in the learning curve, these payments were \$2,000 to \$3,000 (1250 to 1875 pounds) per quarter. Soon after, quarterly bonuses began to average \$4,000 (2500 pounds) per quarter or \$16,000 (10,000 pounds) per year (Selky and Freeland interview, 4 December 1998; Magnum et. al., 1996).

The compensation system plays a central role in supporting the I/N work system. According to I/N president, Selky, "If you are going to tell them they're responsible for quality then you better pay them for good quality and not pay them for tons of any quality" (personal interview, 4 December 1998). The bonus system has proved to be central to the idea of paying for quality. According a local union official, in the beginning, the bonus was seen as too generous.

"John wasn't sure that he wasn't throwing a whole lot of money at a pie in the sky idea – I said, John, you recruited those people, you know the intellect, you know the caliber, if you reward them handsomely they won't disappoint you. And they didn't. We set two world's records." [The compensation system] continues to drive the plant. (personal interview, 12 February 1999).

Within two years it was evident to all employees that the bonus system did in fact pay. Commenting on the friction in an initial arbitration round over the bonus and his later pleasure at being proven too sceptical about the timing and amount of the bonus, Selky said:

‘Our 1987 pre-startup agreement introduced the concept of a quarterly bonus plan to begin *after* [emphasis added] the plant reached ‘steady state.’ In retrospect, if we had not introduced the bonus immediately at startup in 1990 and then allowed the plan to pay progressively more money along the learning curve, we would have taken much longer to reach steady state.’ (personal interview, 18 July 1999).

3.3.3.9. Labor relations

For most of the 1990s, the labor relations environment of I/N could be characterized by a high degree of trust and mutual respect. Workers at I/N are represented by the USWA. However, the I/N local union operates independently from that at Inland’s Indiana Harbor Works and negotiates a separate contract tailored to the specific needs and progressive labor market system of the new facility. The union participates in the company’s joint governance structure and plays a key role in reinforcing team autonomy in production.

Good labor relations at I/N did not automatically materialize. Both labor and management had to learn how to relate to each other differently because the core labor and managerial force came from the traditional labor relations environment at the Indiana Harbor Works. The learning process involved training and was reinforced by experience in the joint implementation of the I/N work system - from the development of its mission statement and statement on values through weathering the challenges of the learning curve process following start-up. The behavior of various actors and their implicit and explicit commitment to each other and the venture provided a

foundation for solving future problems. Employment security clauses helped to bolster these commitments.

Management's respect for the union's position on key issues, and vice versa, facilitated this process. For example, management initially wanted to make use of "buffer" contract workers (mimicking Japanese work systems) but acquiesced to the union's opposition. The union, in turn, allowed management to create an internal class of employees called material handlers whose pay was significantly less than those of other bargaining unit members. Management and the union consistently opted to give employees responsibility and autonomy. There was an early decision not to put turn foremen on the floor. In contract negotiations along the way, management and union members often had substantive differences, but were usually able to resolve them without the use of an arbitrator.

Both management and bargaining unit members went through stages where their commitment to stated intentions and plans was tested. For example, when the initial Japanese training team returned to Japan to settle visa problems, it soon became apparent that the Japanese trainers had been too often stepping in to operate the equipment and to fix problems themselves, rather than training employees. As a result, when the Japanese team returned they were told to try harder to advise and *train*, and not to take over when problems arose. In response, the Japanese (who had originally lobbied strongly for turn foremen but were turned down by the American JAC) now began to question the wisdom of this decision. JAC members again decided against turn supervisors but agreed to station engineers on the floor for a few weeks, only as a resource. During this time, workers were allowed to learn and to make mistakes. According to Selky, "At that time ... we had a number of strip breaks in the furnace which were very costly ... but gradually people learned how to react - it just took time." (personal interview, 4 December 1998). This kind of common sense faith, both in and between I/N management and employees was pivotal in creating a high trust, functional work culture.

Evidence of the positive labor relations environment could be found in the high level of employee persistence. Quits and/or layoffs were virtually nonexistent until only recently. According to Selky and Freeland, during the first eight years of operation (1990-1997) only about five to ten people from labor and management left voluntarily. It was also noteworthy that only one bargaining unit employee was terminated for cause after an arbitration hearing failed to reinstate him. (personal interview, 4 December 1998).

3.4. Sustaining the Work System

Commitment to the I/N venture by local management and union members, high level officers from Inland and Nippon Steel, I/N suppliers and customers, and the local community helped to ensure its successful start-up and implementation of its functional work system. Because of this, I/N overcame initial resistance and the inevitable crises and pressures experienced during the startup and implementation phases of a new operation. However, ensuring longer-term success was a much more difficult task. The following section documents some of the ways in which institutionalization of the I/N work system was attempted and vulnerabilities were exposed as the Tek and Kote work system evolved within its particular context.

3.4.1. Insulation from internal and external pressures

One of the primary strategic approaches taken by I/N decision-makers was to direct the focus of productive agents on particular jobs and to assign them the authority and autonomy to accomplish their required tasks without distraction. For production employees, the objective was to produce high quality flat rolled steel efficiently; it was not to worry about how Inland's stock price was doing, or how Inland's Indiana Harbor Works employees felt about the I/N venture. According to local management and union representatives, the "willy nilly of the world" in many instances was a distraction for production employees; and it was management's responsibility to insulate employees from

unimportant “noise.” Therefore, while management gave employees significant autonomy over production and work system decisions, there was explicit acknowledgment by all parties involved that managing I/N’s external environment by top-level plant managers was critical to making employees effective at the production level.

This insulating process is illustrated by a “structural systems” diagram, “the cable,” used by I/N management early-on in the process which pictures strategic and management levels insulating the core operating system, the level at which productive inputs are combined to produce quality output. At the strategic level, responsibilities included “relating the environment to the organization” and “providing business direction;” at the management level, responsibilities included “managing the forces for change against the forces for stability” and “designing information and decision making systems.” Using this framework, top-level plant management would take actions at the strategic level to allow lower level employees the autonomy and responsibility to keep the core operating system running smoothly.

This approach depends upon committed decision-makers who understand the work system and are able to distinguish what to do and when. Under Selky's leadership, the system worked effectively. This was in part due to I/N's managerial structure with direct internal lines of authority to the plant president and then to the corporate Chief Operating Officer. The Human Resources (HR) Manager, for example, reported directly to the plant president, Selky, who himself was an officer of Inland Steel Company, reporting directly to the president. As a result, I/N's interests were represented directly to top corporate leadership. This served to protect the core operating system from pressures generated by the possible divergence of interests between I/N and the Indiana Harbor Works that might subordinate I/N's interests to those of the steel company.

The Indiana Harbor Works has always been a dominant influence in Tek/Kote's external environment; and a consistent theme in the relationship has traditionally revolved around costs. When Inland's profits sag, for example, pressure mounts to cut measurable costs wherever in the corporation they can be found - not only at the Harbor Works but also at I/N. Until only recently, however, I/N was relatively protected from corporate cost-cutting measures. The recent ownership change, coupled with an unprecedented flood of cheap imports in 1998, has put managers under more pressure to cut costs than ever before.

Pressures relating to costs and originating in the social relations of production at the corporate level began during startup, when Inland faced financial difficulties and the I/N facility was expensive. As a result, there was a lot of criticism directed at the venture, with Inland's Indiana Harbor Works bargaining unit and first level management employees assigning blame to I/N for Inland's performance problems. At the time, Selky, the plant president, Dennis Freeland, the controller, and other executives and managers were often put in the position of having to resolutely defend the plants and to soften negativity of the Harbor Works employees so that I/N employees would not become demoralized. However, Selky's position as an officer of Inland reporting directly to the corporation's president gave him added clout. This allowed I/N employees to feel relatively confident that their interests were being represented and supported.

The I/N operating system was also insulated from external pressures by a supply agreement with Inland stipulating that steel supplied to I/N would only be from Inland. Operating funds were also provided by Inland based on the Inland Nippon Steel Partnership Agreement. During the start-up phases of operation, when bugs were worked out of the system, mistakes were made and learning took place, these financial arrangements protected the new facility from competitive market pressures. They also protected the facility in the event of catastrophic breakdown of equipment or any other such unforeseen

event that might impact costs. Through time, as I/N broke world records for efficiency and quality, doubts about its profitability were dispelled. Still, the financial arrangement with Inland was an important buffer against external market pressures during the period of time when the new work system was most vulnerable.

The joint venture with Nippon Steel Corporation has also served to insulate the plant from certain external pressures, particularly those revolving around short-term costs. Nippon's objective in the venture has traditionally been oriented towards assuring the production of consistently high quality steel at high volume. This is because the specifics of the financing arrangement are such that Nippon earns a return on their investment based on operating hours of the major production units, not cost cutting. This arrangement has at times put the two partners at odds with each other, because Inland's profits from the joint venture are more closely linked to operating profit than are Nippon's. Additionally, and partly because bonus payments to bargaining unit members are largely based on quality and the volume, Nippon and the union more often than not find themselves on similar sides of particular issues.

NIPPON in general can be characterized as long-termist and interested in cooperatively solving problems relating to production and the work system; and initial members of management and the union clearly felt this influence. When asked during the 1980s whether what they saw at Nippon Steel's Hirohata works could be replicated in the U.S., John Selky's thoughts were:

“It's going to be a question of the people because obviously [the Japanese] work differently....Japan's steel industry had their last work stoppage in 1959 like American steel but after that the government, the union, and the corporations agreed to never have that kind of adversarial relationship develop where we would stop our operation. They didn't really have company

unions but they sure had cooperative understandings and very open communication.” (personal interview, 4 December 1998).

This understanding of indigenous Japanese work systems and labor relations combined with partnership with Nippon in the U.S. helped to guide employees towards more cooperative approaches. Commenting to a reporter in the early 1990’s, the I/N union president said:

“The Japanese have been a good role model. We might traditionally nip at each other’s heels being union and management. The Japanese think things through and look at it from all different angles and they brainstorm on how to resolve an issue. That tends to rub off. I feel very lucky to be here. It’s new technology. It should give me a stable income. When I come to work, I have something to give. You can’t put a price on that feeling.” *Paul Rausch* (Cohen, 1990).

Through time, Nippon has become less visible, due in part to problems in Japan during the long downturn and the gradual reduction of Japanese employees at the plants. However, Nippon’s influence still is important, and continues to influence decisions after the ISPAT buyout.

3.4.2. External pressures and internal frictions

As evident from the discussion above, tension between the Harbor Works and I/N has been apparent from the start, although at certain times it has been more submerged than at others. Much of this tension revolves around the fact that a clear vision of what the relationship would be was never articulated and then institutionalized. Financial projections that anticipated much higher prices for I/N products never materialized, and this made matters even more difficult. Ideas about what and how Inland and I/N would learn from each other were not consistent; and a clear consensus on the degree of autonomy that I/N should have from the Harbor Works has not emerged.

One of the main reasons for this lack of understanding may stem simply from the fact that high level executives and managers at the Indiana Harbor Works were not fully involved with and trained in the process of creating and operating a work system like the I/N joint venture. According to Selky, managers at the Harbor Works who did not participate in the startup process may not be able to identify with the new work culture or may not have the desire to make it succeed. (personal interview, 4 December 1998). In this scenario, plants become more dependent on particular individuals who must insulate them from the influence of an organization which does not fully understand what has been created “out there in the cornfields.” Finding managers from Inland to replace managers retiring from I/N also becomes problematic.

Although I/N created a highly successful work system substantially different from past models, it has often seemed as though Inland was not interested in learning from the I/N experience, and in fact wanted to suppress it. Frequent management changes at the Harbor Works compounded problems. This inability to respect the original mission to create a new work culture and then to transmit lessons was frustrating to managers and employees at Tek and Kote. Freeland recalled that it was like:

“We were commissioned by the king to go out and find new land and do missionary work and once we understood best in class practices ... to share that information....well now we’re coming back, the king is dead, the entire leadership has changed, and they are saying “who are you?”” (personal interview, 15 December 1998).

Elaborating on the confusion caused by shifting leadership, Freeland said

“to me, that was one of the primary problems that we had. It was always changing... what we were. The finance people at the Harbor were always caught in that, where they wanted to report Tek and Kote results managerially, as if we were part of the steel company, but yet we were trying to operate discretely as a separate company, and it was always a conflict. And it was always a situation of “should we centralize, or should we not centralize, should you really have your separate finance department there, or should you be reporting back to Inland.” (personal interview, 15 December 1998).

Confusion continues to this day, with the latest swing towards consolidation at the Indiana Harbor Works.

These swings inevitably pressure the plants towards a more traditional work system. Reflecting on the rhetoric of the “new work system” and the reality of the pressure coming from the Harbor Works, one manager said:

“They told us to go out there in the corn field and be different. They promised that to our employees. And then we turn around and we don’t walk the talk.” (personal interview, 17 March 1999).

Recalling a consultant’s comments before both plants were even started up, this manager also noted:

“The consultant said ‘you need involvement from the highest levels of the company because when you go into something like this in a new venture, one of two things will happen...you’ll be the point of a wedge that will drive this work system back to the bigger company, or, sooner or later, they will send Attila the Hun out to stamp out the revolution.’ I reflect a lot on that in the last year, because a lot of the actions are to stamp out the revolution.” (personal interview, 17 March 1999).

In fact, developments at the highest levels of both managerial and union leadership throughout the 1990's created pressures that appear to be pushing all players into more traditional directions. On the management side, turnover prior to the ISPAT takeover – both at Inland and at I/N – contributed to increased fragility of the work culture. Although I/N leadership was stable through the 1990s, leadership changes at Inland's strategic level were relatively frequent, causing shifts in management philosophy that caused confusion, and often hard feelings on all sides. At the plant-level, with Selky's retirement in the spring of 1998, I/N was put in a vulnerable position, and replacing him was a difficult task. Selky was respected on all sides, and clearly had an ability to empathize with employee positions. A local union official said: "He's one of the most level headed guys I know. Quite often we had much different approaches to similar issues, but I always respected him. He's just a guy who is always straight up." (personal interview, 16 November 1998). From the beginning, Selky was determined to create a steel plant with a fundamentally different work system - and with unionized employees.

This is not to imply that the work culture was completely harmonious during Selky's tenure. Problems did arise, and some of these problems caused substantial frustration. One such event occurred in 1993 when a small group of white-collar employees at I/N started an organizing drive. The resolute corporate campaign against the drive created disappointment on the union side. As a local union official put it:

"Clearly [Inland leadership] said [to Selky]: You can not let that happen. These are all pressure tactics that notoriously anti-union companies use on their employees. And here I am sitting there thinking "which is it?" They're going to all this trouble and spending all this money trying to bust up this little O and T [Office and Technical workers] organizing drive. And at the same time they want to go on TV and smile and shake my hand

and give me a plaque [because of our innovative labor relations environment].” (personal interview, 12 February 1999).

Although this did not cause much visible turmoil, it did erode morale:

“It wasn’t really much talked about – it was sort of a wink and a nod ... well, you know, we gotta do what we gotta do, and you gotta do what you gotta do ... and I would respond, yes, and you know I have to do what I have to do – the corporate game – but it was extremely disappointing.” (personal interview, 12 February 1999).

On the management side, there was frustration that O and T white-collar employees were not satisfied with their wages despite the fact that they were relatively high by local standards. Here again, regardless of what Selky may have personally felt, pressure from Inland was intense to keep the bargaining unit members limited to production and maintenance employees.

The current plant president of I/N is viewed by production employees as a more traditional type of manager, contributing to an erosion of trust and morale. This has been exacerbated by developments following the ISPAT takeover, which occurred soon after his appointment. Further, he is not an officer of Inland as Selky was; and he reports to a vice-president at Inland rather than to the president, reducing his influence and consequently his ability to effectively represent and protect the interests of I/N and its employees.

On the union side, Lynn Williams’ recent retirement as president of the USWA and his replacement by George Becker has caused frustration among I/N management, who view Becker as a more traditional union leader, willing to “knock heads and bring management to their knees.” In contrast, Lynn Williams was a firm supporter of the type of work system created at I/N and a more cooperative approach to labor relations. Additionally, and analogous

to I/N management difficulties in selling the work system to Inland as leadership changed, the I/N local union leadership has faced mounting difficulty defending their approach, to both the local union at the Harbor Works and the international union.

In short, although the I/N work system is remarkable in its achievement of cooperative labor relations, innovative work structures, management methods and human resource practices, it was not devoid of problems. Jointly solving some of these problems, especially those relating to I/N's immediate task of producing high quality steel, strengthened the work culture. However, other problems, often stemming from external sources, served to weaken it. The failure to create a productive system totally autonomous from Inland meant that I/N remained vulnerable to strategic level decisions subordinating local interests to those of Inland corporate. This made it harder for I/N to create "deep roots" for the work system. Adding to this, the retirement of I/N's president, John Selky; continually changing leadership from Inland; and the retirement of USWA president, Lynn Williams, put the labor relations of I/N under greater pressure. I/N's roots are now being tested in a way that no one in the plant could have anticipated ten years ago.

"It would be great if an orderly transition had happened, to see if those roots took hold and were healthy. But with a change in control in the acquisition, and the abrupt termination of some of the senior management people who had designed some of the original things, we're not in a position to make this orderly transition and pass on some of the legacy and information. That complicates it – you've just changed all the players - it would have been nice to know what the alternative would have been, what would have happened had I had the ability to talk to a lot of people and mentor a lot of people; but that never happened. You'll never know how the joint ventures would have matured.." (Dennis Freeland, Personal interview, 4 December 1998).

Freeland and other senior managers were notified of their immediate termination on 31 July 1998.

3.5. ISPAT's Takeover: How Deep Are the Roots at I/N?

During the mid- to late 1990s, Inland Steel's performance was considered to be among the more stable in the industry, due in large part to the restructuring and technology investments that were made during Luersson's tenure as CEO and with the aid of Nippon Steel's financial and technological support. According to industry analysts in November 1997, "[Inland's] income results [were] among the more stable in the integrated group, with profitability now having been recorded for four straight years" (Valueline, 7 November 1997, p. 1400). However, it was also noted that, along with most other American steel companies, "despite the positive things now going on here, the stock is still accorded a low valuation by Wall Street" (Valueline, 7 November 1997, p. 1400). Because of its poorly performing stock, Inland's top officers continued to search for ways to increase share prices. In the end, they concluded that Inland needed "to find a buyer" (Arndt, 18 March 1998). In 1996, Inland considered selling its steel-making operations to US Steel Corporation. In October 1997, Inland CEO Darnell got together with the CEO of ISPAT, a Dutch-owned conglomerate, head-quartered in London, and began to seriously discuss the idea of a possible sale.

ISPAT had been attempting to buy an American steel company for more than a decade. In 1992, ISPAT made an unsuccessful attempt to buy Bethlehem Steel's former Bar, Rock and Wire Division in Johnstown, Pennsylvania. However, the deal fell through when ISPAT and the USWA were unable to agree on a new contract. ISPAT also considered purchasing McLouth Steel in 1996. According to ISPAT CEO, Mittal, "Our strategy is to create a global steel company" (Chicago Tribune, 18 March 1998). With operations in India, Trinidad and Tobago, Mexico, Canada, Germany, Ireland and

Kazakhstan, ISPAT had not yet secured a location in the United States but was determined to do so.

On 16 July 1998, ISPAT International officially acquired Inland Steel Company, including its 60 percent share of Tek and 50 percent share in Kote, for \$ 1.43 billion (900 million pounds).³ Nippon Steel still owns its 40 percent of Tek and 50 percent of Kote. According to a metallurgist recently laid off at the plant, the Japanese were informed of the buyout shortly before it was made public (personal interview, 7 September 1998). Although Nippon initially debated what to do, an agreement by ISPAT and Nippon to continue the joint venture was announced on 6 July 1998. The Inland purchase represents ISPAT's first move in the United States. Its stated plan is to use Inland as the headquarters for its North American steel holdings.

Although the local 1010 union and the international union formally objected to the ISPAT buyout, they were unable to raise the capital to purchase and run Inland as an employee-owned company. As a result, they acquiesced to the deal but remain suspicious of "the axe-wielding Mittal, known for his brutal cost-cutting methods ... [Inland] workers ... felt that he would resort to extreme measures and reduce the workforce to a bare skeleton" (Manik 1998, p. 46.). Although Inland CEO, Darnell will continue serving as top corporate manager under the new ownership. ISPAT has a history of replacing top management with its own management team.

ISPAT's stated business model for Inland involves a 20 percent reduction in employment and costs and a 20 percent increase in output. Measurable cost cutting is central to ISPAT's philosophy, and stems partly from a century old Indian "Partha" accounting practice, by which all costs are calculated at the end of each business day. "I tell all my managers that I expect Partha-style accounts each day. They say I am insane, but I tell them that's what you have to do if you want to work for ISPAT" (Evans, 1997).

It is clear that reducing employment costs is one of ISPAT's strategies for increasing competitiveness as there have been layoffs at many of its acquisitions. However, according to ISPAT, laying off employees is not the only strategy for reducing employment costs. As the Inland takeover became public in the spring of 1998, ISPAT's Mittal addressed initial concerns and skepticism regarding ISPAT's intentions by stating that "ISPAT doesn't necessarily focus on reducing employment. It instead tries to increase volume to reduce employment costs ... I haven't reduced employment in Canada beyond our commitment to the union" (ISPAT, 1998). Nevertheless, once the acquisition of Inland was finalized, ISPAT immediately cut costs through management layoffs at Inland's Indiana Harbor Works and I/N. In all, 300 managers and white collar staff were laid-off, representing a 17 percent reduction in the staff that is not under contract (Arndt 1998). The following is from a company press release on ISPAT's web page:

"ISPAT International N.v. also announced that the integration of recently acquired ISPAT Inland Inc. into the organization is making good progress, and to date has been realizing the synergies and cost reductions as per its business plan. For example, immediately after the acquisition of ISPAT Inland, there was a reduction in the non-unionized white-collar work force by 17%. Further, considerable progress has been made in realizing global purchasing synergies and to date, the Company has achieved more than 25% in annualized savings as compared to \$120 million planned reduction over three years" (ISPAT International Company Press Release, 10 November 1998).

While employment at Inland's Indiana Harbor Works has been steadily reduced since 1980, this is only the second time in I/N's history that anyone has been laid off. Having survived three down-sizings at Inland,⁴ in 1997, prior to the ISPAT buy-out, 13 out of 195 I/N employees (both Japanese and American) retired or were terminated; in 1998-9, 52 more positions were eliminated,

representing a reduction of approximately 33 percent. Already, the management down-sizing has been accomplished and decision-making units at I/N have been centralized back or report to managers at the Indiana Harbor Works. Those units remaining at I/N have been stripped to a bare minimum as employees attempt to run the facility with 33% fewer managerial and staff positions.

According to an I/N USWA official, unionized employees interpreted Ipat's actions as a warning shot for what is to come this summer, when the collective bargaining contract is now up for re-negotiation. In his view, local management at the I/N facility, in the midst of a shift at the strategic level towards a cost cutting approach and fearful for their jobs due to initial white collar layoffs, will begin to "manage" by attempting to cut costs where they are most visible. Obvious, easily measurable possibilities include bargaining unit job cuts and/or significant wage concessions. This runs directly against the grain of the two prior agreements; both of which emphasize the importance of employment security and a generous compensation system for supporting the long-term viability of the work system. This low cost orientation is also fundamentally at odds with the requirements of a high performance, functional work system; and it is obvious that ISPAT's cost cutting strategy has already eroded faith and trust among bargaining unit members. One bargaining unit employee said:

"Cost per ton. Culture be damned. Cost per ton. Everything ... ISPAT is telling Inland and New Carlisle ... you buy pencils? I want you to reduce the cost of those pencils. Cost per ton of steel produced. Everything ... Holders, pencils, light bulbs. And I don't want to hear about culture and this is a good thing ... this is warm and fuzzy. I want to know the cost per ton to do that. I don't want to hear about people issues, or that's not how we play ... in the perfect world, account for everything every day. At the close of the business day, your paper work should

account for every penny either generated, used, or paid out today” (personal interview, 12 February 1999).

ISPAT is also rapidly centralizing authority and pulling control upward in the organization. An important example that has had a dramatic demoralizing effect on I/N employees relates to purchase orders. Prior to the ISPAT buy-out, bargaining unit employees had the authority to help select vendors and to make required purchases. As a result, a network of reliable supplier relationships was developed. When ISPAT took over, however, it removed this right from I/N employees and instead imposed its own purchasing system with the objective of locating the lowest cost suppliers on a global basis. Changes like these have significantly affected the I/N labor relations environment and employees’ attitudes towards the productive process as a whole. According to a bargaining unit employee, immediate cost currently overrides maintenance and quality concerns. Reflecting on the differences in maintenance since ISPAT’s takeover of Inland, he said:

"So the focus that we had as an organization day to day on how do you do maintenance – what creates an effective maintenance program, is out the window. We’re living on our past glory.....We are shifting from a guaranteed availability of line time driving the maintenance organization to a very traditional run it till it breaks, glue it together, run it again until it breaks, don’t buy spare parts, don’t anticipate your needs.....let’s wing it" (personal interview, 12 February 1999).

Since August 1998, radical changes in employment, working conditions, benefits, and reporting relations have been made. This process has been identified as “cherry picking” by I/N bargaining unit and management employees alike. In the words of one I/N manager, “Pieces of the work system are now being cherry picked. Pieces of it are being pulled out and re-centralized back to the Harbor” (personal interview, 17 March 1999). Speaking the same language, a bargaining

unit employee noted that the tree may not be able to survive the picking, especially when the cherries are actually the roots of the tree – roots which include labor-management trust, security, and autonomy for employees. I/N's benefits package has been adjusted downwards to match the standard of the Indiana Harbor Works Plan. Pensions have been made portable to encourage early retirement and resignation of personnel. Reporting relations have been changed such that I/N section managers report to managers at Inland Steel Company rather than to top I/N management. Although still seemingly protected to a limited degree by its Japanese parent, Nippon Steel Corporation, conditions are changing rapidly at I/N and the work system is showing signs of deterioration into a more traditional form.

4. Conclusions

The I/N case demonstrates the benefits associated with functional work systems for the firm, its employees, the local economy in which it is embedded and the macro-economy. By providing stable employment, relatively high and stable incomes, high levels of training and skill development, good working conditions, employee autonomy and participation in the productive process, functional work systems lay a foundation for high and rising living standards. Based on a system of co-operation among productive agents and resources, they are efficient in helping the firm to meet and even exceed the demands of its product markets. Further, the long-term nature of production relationships within these systems provides a context in which the firm can focus on continually improving product and process quality and efficiency for long-run productive system success rather than on cost cutting and other strategies designed to maintain short-run profit margins. This case thus provides powerful evidence of the profitability and positive externalities generated by taking a high road approach to resolving product market pressures.

Despite these positive outcomes, the I/N case also shows how fragile functional work systems are in the context of unregulated markets that

subject them to low road pressures. This is particularly true in markets with stock market based financial systems like that in the U.S.. Firms that choose to implement expensive, high wage functional work systems (the “high road”) must compete with low wage (“low road”) firms that ruthlessly cut costs in the short run. In this context, they may not be able to justify the costs if in the short run they are underpriced by cost-cutting low road firms which at the same time look more attractive to shareholders. Given the American free-market, free trade orientation of recent years, many firms are racing to the bottom as they seek out the lowest possible labor costs globally. In the case of I/N, the recent acquisition by Ispat seems to represent a case of a high road plant being acquired by a low road firm. In this context, the lessons all too often flow in the wrong direction.

In theory, stock market performance is assumed to reflect product market performance, however, this relationship is becoming less and less apparent, particularly from the perspective of the long-term. While product market success depends on production efficiency and organizational responsiveness to changes in technology and product market conditions, financial market success increasingly depends upon the maintenance of high and continually growing share values. Product market and stock market requirements diverge because stock market pressures often precipitate managerial strategies and approaches at the level of the productive system that undermine its ability to succeed in its product markets over the long term. If the firm’s shares are publically traded, its managers are under pressure to continually cut costs and restructure operations in an effort to generate growth in short run share values. This pressure forces them to focus on boosting short run share prices, inevitably setting off a downward spiral of measurable cost cutting and restructuring, most often directed at the most easily controlled costs: labour costs. The danger with this approach is that, continued long enough, it strips the productive system of the human resources and skills required for long term production effectiveness. In this context, there is also a tendency to engage in work restructuring that essentially intensifies the work

process, under the guise of such objectives as *cooperation*, *empowerment* and *multi-skilling*. This strategy often exhausts, discourages and disillusion the affected workforce, undermining the positive relationships and trust that had been built. As a result, the work system degenerates into a dysfunctional form. When short run cost cutting measures do not generate appreciably higher stock prices, more drastic measures are often taken, including selling the firm off if share prices remain depressed. Globalization augments the problem by pitting work systems - and by extension, local and national economies - into competition with each other, and setting off a race to the bottom that ends when the system reaches its lowest point - where labor costs and labor market conditions and standards are at a minimum, globally. This type of approach discourages innovation and undermines incentives for creating and sustaining co-operative work cultures that depend to an important degree upon environmental and institutional stability. Thus, regardless of how effective the internal labour market and work system are in helping the firm meet and/or exceed the requirements of its product markets, it is vulnerable to the damaging effects of stock market pressures and the responses they generate.

Part of the problem, certainly, is the difference in the time horizons of the two markets (capital and product markets). Capital markets reward short term appreciation in share values; and capital moves quickly to the sources of greatest return. In contrast, product markets reward effective production and market performance, the long run success of which depends upon a long-term view of productive and market relationships. Long run productive efficiency requires continual investment in plant and equipment, provision of some minimal degree of employment and income security to maintain and develop requisite human resources, and the provision of training to maintain and develop the requisite skill base. It also requires the development of reliable supplier relationships to guarantee procurement of necessary productive resources and the establishment of consumer relationships

through effective channels of distribution and through the reliable provision of good quality goods and services at acceptable prices.

Another problem relates to power imbalances among stakeholder groups at various levels of organization, shifts in those relationships and the failure of regulation to redress the imbalance. During the 1970s, in a context of widespread industry crisis, there was a discernable shift in power away from trade unions and towards employers. This was a period in industrial history when bankruptcy and organizational failure rates were high and survival was the objective. In this context, corporate restructuring was driven by intensifying domestic and international competition and rapid technological change, and was characterized by efforts within firms to reduce costs and improve productive efficiency in order to meet competitive challenges (product market and technology).

More recently, with intensifying pressure from stock markets, power has shifted away from employers' ability to exercise internal control as they are increasingly subject to forces controlling them from the outside, primarily those of institutional shareholders whose objective is short run share value appreciation. This is generating another period of corporate restructuring, again aimed at reducing costs and improving efficiency. But the objective this time is not to improve the productive system's economic and product market viability so much as it to generate a continuous series of short run improvements in its share value performance. The product market is thus no longer the primary source of pressure; dominant pressures now originate in the capital market. In this context, American company law (designed to promote share value maximization) serves to strengthen and protect the power of these outside controlling forces. In contrast to other systems, like Germany and Japan, American institutional shareholders are not socially or legally bound to the strategies and performance of companies for which they hold shares. They are therefore free from responsibility for the long-run fate of those companies, except to the degree that they have money invested in their shares.

The problem is further complicated by the inherent contradiction in the nature of stakeholder roles and objectives. Because workers (and managers) are also consumers and savers – and vice versa – their respective interests in those different roles are in opposition. As consumers, they want low prices, often achieved through price cutting, labour shedding and work intensification; as savers, their financial capital is held as equity in pension funds invested on the stock market, the managers of which are pursuing short-term gains. This adds to pressure to cut costs and restructure work in ways that are not in the interest of workers (and managers). This schizophrenia makes the identification and pursuit of stakeholder interests – other than those of owners / shareholders – increasingly problematic.

In short, stock market based financial systems provide both incentives for and justification of corporate-level strategic decisions that generate short run shareholder profits but subordinate the interests of all other stakeholders to those of the shareholder. With deregulation, capital markets, product markets and labor markets (work systems) are becoming even more opposed. The problem confronting firms is how to resolve unremitting pressures from the stock market while at the same time meeting the requirements of their product markets for steadily improving product quality at competitive prices.

As demonstrated by the I/N case, in national frameworks like the U.S., it is difficult for a firm to compete over the long term using a high road strategy. This is particularly true if it is subject to low road pressures and a stock market that rewards short term share value appreciation above all else. This difficulty is compounded by the absence of mechanisms or a forum for resolving the conflicts and divergent pressures and outcomes that are generated in such systems. This is in contrast with other national frameworks, where such mechanisms and forums do exist. In the German system, for example, there are thick institutional networks within which individual sets of relationships evolve and where divergent interests can be resolved in

mutually satisfactory ways; in the Japanese system, these difficulties are largely resolved by high standards of business ethics.

The I/N case shows that there are important performance benefits and positive externalities associated with high road strategies and functional work systems. It is thus in the interest of stakeholders and the host economy to encourage their development and survival; and there is a need for regulation that protects and supports such systems, to promote the long run economic viability and performance of the productive system (local, national and global) as a whole. This regulation would include policy aimed at providing a supportive macro-economic context; stabilizing the firm's financial environment; reducing the relative costs of functional work systems; and redressing the power differentials among markets and stakeholder groups. It would also include efforts to provide greater employment security by establishing a macroeconomic context that supports employment growth and provides unemployment protections so that job loss is not a catastrophic event. Regulation should also aim to develop and support effective forms of representation so that different stakeholder voices can be heard and divergent interests be resolved. Further, labor market and product market institutions should be developed to provide a supporting institutional framework within which competing pressures from various markets and other sources can be resolved. This would permit firms to operate both competitively and flexibly without forcing their involvement in the destructive downward processes that unregulated markets with low road pressures generate.

The I/N case offers insight into the interrelationship between work systems, living standards and performance. It shows, clearly, that a high road approach and functional work systems positively impact stakeholders' lives, improve production efficiency and benefit the local and macro-level economies and societies in which they are embedded. It is also evident that such work systems can be implemented in contexts with a history of adversarial labor-management relations. However, the market system creates a situation

where firms' commitments to stakeholder groups are increasing conditional, their commitment to employees, for example, being conditional on successful stock market performance and the work system effects of strategies designed to accomplish that end. As a result, maintain the foundational co-operative productive relationships becomes difficult. Further, because of the inherent contradiction between strategic approaches to maximizing stock market and product market success, these high road systems are fragile in national frameworks that subject them to low road pressures without a forum for resolving the difficulties that arise from opposing market pressures and responses.

APPENDICES

Appendix 1: The Indiana Harbor Works: The Inland Steel Flat Products Company and Inland Bar and Structural Company

The Inland Steel Flat Products Company produces flat products which are cold rolled and coated for the automobile, appliance, office furniture and motor manufacturing industries. It operates within a modified, but largely traditional system. Since Inland's steel making operations have historically been located at a single site, its labor force has never been divided into different plants, serving to facilitate collective bargaining within the company as well as the achievement of company-wide agreements on restructuring, the organization of work and relationships. Although resistance to change has come from both the labor force and management, Inland has aggressively pursued restructuring efforts involving extensive training programs for both labor and management, and involvement of both sides in the process of change. The result has been gradual movement away from the traditional steel industry system and toward a more flexible and participative one. Inland as a company leads the industry in this process.

*Inland Steel Bar Company:*⁵ By the late 1970s, competition, primarily from the minimill sector with its ability to produce ever improving quality products at low cost, had eroded the profitability of Inland's Bar and Structural Divisions, which represented 15% of Inland operations. In response, Inland decided to focus on the high quality segment of the Bar and Structural Products market. In order to compete with the minimills, it created the Inland Steel Bar Company as a separate business unit, with a certain degree of autonomy from the other divisions at the Indiana Harbor Works, although its labor force is represented by the same USWA local as the rest of the Harbor Works, and its management is Inland Steel Company management. It competes in the high quality end of the minimill sector market and with specialty steel producers, markets which require responsiveness to demand with products of consistently high quality and competitive price.

Inland invested \$100 million in capital improvement and new technologies for the new company and embarked on a major retraining program. Progress was impeded by strong union resistance due to fear of losing jobs and a history of mutual labor/management antagonism, lack of respect and distrust; a skeptical labor force because of the company's historical failure to deliver promises of 'employee empowerment;' and management resistance to changes which undermined traditional sources of personal power. Despite this resistance, the union and company eventually negotiated an agreement which called for skill - based pay, self - directed work teams and labor force empowerment.' This agreement represented a radical departure from the traditional way of doing things at Inland Steel Company, as well as a departure from the way things are done at the Inland Flat Products Company, which continues to operate within a system that involves job - based pay; narrowly defined jobs and rigid seniority units; limited worker responsibility and tight supervision. Although still in the early stages of development, the Inland Bar and Structural Company is making progress toward achieving the objectives of its foundational labor/management agreement.

Figure 1 provides an overview of Inland's three operating units.

Figure 1: Firm - Level Diversity at Inland Steel Company

	Inland Steel Flat Products Company	Inland Steel Bar Company	I/N Tek / I/N Kote
Ownership			US: US: US and Japanese:
Structure:	Inland Steel Company	Inland Steel Company	Inland and Nippon
Organizational Structure:	Centralized Authority No Autonomy	Decentralized Authority Company Autonomy	Decentralized Authority Plant Autonomy
Products:	Flat Products	Special Quality Bar, Alloy Bar, Engineered Bar and Shaped Products	Highest Possible Quality Cold-Rolled and Coated Sheet
Consumers:	I/N Tek, Automobile, Appliance, Office Furniture and Motor Manufacturing Industries		I/N Kote, Automobile, Appliance and Office Furniture Industries
Technology:	Modernized, Traditional Integrated Technology: Blast Furnaces, Oxygen Furnaces, Continuous Casters, Rolling and Finishing Mills	Modernized Minimill / Specialty Technology: Electric Arc Furnaces, Continuous Casters, Rolling and Finishing Processes	State-of-the-Art Continuous Cold Rolling and Finishing Process; State-of-the-Art Galvanizing and Coating Processes
Managerial Hierarchy: Direct Supervision: Control over Process:	Flattened but Traditional Managerial Structure Reduced but Extensive Management Control	Flat Managerial Structure Limited: 'Resources' Joint Management and Labor Control (Mgmt Supercedes Labor)	Flat Managerial Structure None: 'Resources' and consultants Joint Labor Force and Management Control (Team Shared w/ Mgmt)
Organization of Work: Job Structures: Job Classifications: Job Descriptions: Participation:	Traditional, Rigid Job Structures Fragmented Job Structures Extensive Written Job Descriptions Little Partipation / Cooperation in Labor Process (but better than industry average)	Flexible Job Strutures Self - Directed Work Teams Few Written Job Descriptions Participation / Cooperation in Labor Process is being Developed	Flexible Job Structures Self - Directed Work Teams 5 Classifications No Written Descriptions (at first) Participation / Cooperation a Critical Feature of Labor Process
Compensation:	Hourly; Job-based	Hourly; Skill-based	Hourly with Incentive Bonus; Skill-based
Empt Security:	None	None	Explicit Empt Security
IR System: Union: Work Rules:	Adversarial USWA 1010 Written	Improving; Less Adversarial USWA 1010 Written	Nonadversarial; Cooperative USWA 9231 No Written Work Rules

Appendix 2

Vision Statement: Principle Change in Work Culture:

Management's view of work must be that work is not simply a job or a collection of jobs but rather a system in which people come together with a technology, in which disciplines are integrated to produce a product, and in which work can be designed both to optimize the best of the technology and to elicit significant contributions from people. In an integrated work system, all design elements reinforce each other and send similar and consistent messages to employees. Orientation and initiation programs, job definitions, recognition and reward systems, performance appraisal methods, training opportunities, communication systems and the information they provide, organizational structure, work rules/company policies and how they are made/enforced, management's role and modeling by key executives — all of these elements of the system reinforce the notion that each employee is highly valued as an asset and that individual performance is central to the success of the business. This is what it means to create a work culture.

(Management's collective statement on the new work culture at I/N Tek, in 1988)

Vision Statement: Reflecting on 25 Years at I/N Tek

Today is my last day at work (year 2,015), the day I retire from I/N Tek in New Carlisle, IN. I've put in 25 of the most rewarding years of my life. It seems almost like yesterday when my new life and a new cold strip were born. I also remember the old dark days when I worked at the Indiana Harbor Works, and worked just for a paycheck.

Today I get to walk around and say “good-bye” to all my friends, and take a last look at that trend setting cold mill of the 1990’s. You know it’s just as bright and clean as the day we produced our first coil. A lot of changes have taken place since then; a new galvanize and paint line integrated into the flow line, and the new city of I/N Tek, Indiana.

I also leave with a great sense of accomplishment and proud feelings in my heart thinking about our record start-up and the year after year production record breakers we’ve had. But most of all, proud of how I helped to make this pioneering mill the envy of the American Steel Industry and of the World. The success not being derived from just technology, but from the supreme blend of technology and people. People working systems that let people really work together to their utmost potential. But I really feel great about how we at I/N Tek and other pioneering people-oriented companies started a wave of change in the American manufacturing base and help America achieve the pursuit of happiness. How we showed everybody else how super productive a company can be and how happy its workers can be.

Well it’s time to go home now. I leave with a happy heart and a happy wallet. Good-bye everybody! Good-bye I/N Tek!

(Vision statement in 1988 before startup by Dan Narozny - team member)

Notes

1. New workforce techniques have been referred to in the literature by a variety of terms including “high performance”, “high road”, “cooperative”, “functional”, etc. In this paper, to simplify the analysis, such work systems will be termed “functional”.
2. The American steel industry is composed of three distinct sectors: the integrated sector, the specialty steel sector and the minimill sector. The integrated sector is the best known and by far the largest of the three, accounting for approximately 65 percent of domestic steel production. The term ‘integrated’ refers to the fact that firms in this sector are involved in every aspect of steel making - from the preparation of iron ore, limestone and coal to be melted down in a blast furnace, to the production of final steel products in the rolling and finishing mills. Specialty steel mills account for approximately 7 percent of domestic production. These mills produce specialized steel products using high quality steel alloys using a more labor-intensive, low volume production process than in either the integrated or minimills sectors. Minimill steel firms are ‘non-integrated’ steel firms which use scrap steel as their main input; scrap is melted down in electric arc furnaces, continuously cast into semifinished shapes and rolled into finished steel products. Their technological configuration allows them to achieve economies of scale at much lower levels of output than their integrated counterparts. The average annual capacity of a minimill is approximately 400,000 tons of raw steel, compared with approximately 3 million tons in a typical integrated facility.
3. The completed transaction value (approximately \$1.4 billion) included \$650 million for the common stock of Inland Steel Company; \$238 million for the preferred stock of Inland Steel Company (ISC) held by ISPAT International (ISI); repayment of the inter-company debt of ISC owed to ISI, of approximately

\$243 million; and assumption of debt owed to third parties of approximately \$267 million. ISPAT raised a total of \$1.1 billion in debt to finance this acquisition. Of this debt, \$700 million was raised by ISC, comprising two senior secured term loan facilities each of \$350 million, with a final maturity of seven and eight years respectively. ISPAT Sidbec Inc. raised the remaining amount of \$400 million of this debt, electing to treat the transaction for tax purposes as an asset purchase under section 338(h) (10) of the Internal Revenue Code, which is expected to provide an estimated tax benefit of approximately \$100 million on a net present value basis.

4. Inland's Indiana Harbor Work's employment went from 25,000 in 1979; to 16,000-17,000 in the mid-1980s; to less than 9,000 in 1998.
5. Much of the information about the Inland Bar and Structural Company is drawn from Wilgus, 1991.

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