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# The changing nature of labour regulation: the distinctiveness of the National Agreement for the Engineering Construction Industry

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## ABSTRACT

The article addresses the changing nature of labour regulation through analysis of the National Agreement for the Engineering Construction Industry, originating in 1981. It shows how multiple spatial regulatory scales, the changing coalitions of actors involved, employer and client engagement and labour agency have been critical to National Agreement for the Engineering Construction Industry's survival.

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## 1 INTRODUCTION

Much is written on the transformation of industrial relations and the regulation of labour under a neoliberal imperative, leading to decentralisation and the erosion of co-ordinated sectoral bargaining (e.g. Baccaro and Howell, 2011; Marginson, 2015; OECD, 2019). Despite this, there are policy initiatives in Britain to reconstruct collective agreements, for which one of the few surviving agreements, the National Agreement for the Engineering Construction Industry (NAECI), serves as a blueprint (Ewing and Hendy, 2013). The question this raises is how and why has NAECI survived in the face of the disappearance of multiemployer collective bargaining and what significance does this have for labour regulation?

In the role accorded to NAECI, the engineering construction industry in the United Kingdom (UK), characterised by large, often state-sponsored, infrastructure plant projects, flies against the wind of decentralisation and deregulation. The industry employs 188,000 workers and its 'in scope' activities include design, engineering, procurement, project management, construction, maintenance, repair, replacement, testing or decommissioning of any chemical, electrical or mechanical apparatus, machinery or plant, to be used on or installed on a process site, whether in the oil and gas, renewables, nuclear, petrochemicals, pharmaceuticals, food and drink, waste and water sectors [Engineering Construction Industry Training Board (ECITB), 2019a]. As described by Brookes (2012, p. 603), it is

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... a truly global endeavour. Multinational and multicultural projects are the norm encompassing a wide range of disciplines in addition to civil and structural engineering, such as mechanical engineering, electrical engineering, control and system engineering, structural and pipe fabricators, contractor services and logistics.

Not all clients and contractors choose for their projects to be 'in scope', so NAECI covers only part of the industry. Indeed, official figures for 2017–19 show only about 10,235 workers employed directly under the agreement, although 36,000 were recorded in 2008 [Business, Innovation & Skills (BIS), 2009; National Joint Council for the Engineering Construction Industry (NJCECI), 2019a].

National Agreement for the Engineering Construction Industry registered projects are nevertheless some of the largest and most prestigious in Britain, including the £650 million Teeside Biomass project employing over 1,300 site workers, the £350 million Siemens' Keadby project employing 490 and the £500 million Fawley project employing 450 (NJCECI, 2019b). These set a standard for the industry with respect to terms and conditions of employment, including direct employment, working hours, pay and benefits, pensions, disciplinary and grievance procedures, training and skills (NJCECI, 2018). Above all, NAECI is founded on the principle of direct employment, so that sites contrast strongly with those in building and civil engineering, where labour and wage relations are individualised through extensive subcontracting and self-employment (representing in 2019 nearly one million in a workforce of 2.3 million), union membership is low, and regulation weak, with only nominal reference to the National Working Rule Agreement (Clarke et al., 2012; Office for National Statistics, 2019). Critical to regulatory change in engineering construction has been the interaction with the wider construction industry and the contradictions inherent in sustaining a highly complex labour process within a neoliberal capitalist system.

Through the example of NAECI, this article shows how labour regulation has changed significantly since Flanders' (1964) postwar notion, referring to the procedural and substantive nature of collective bargaining and the range of actors and levels where rules are introduced. This change is reflected in debates surrounding the French Régulation School, faced with the challenges of loss of autonomy of industrial relations institutions and the need to reconstruct the *rapport salarial* or wage relation at the heart of the mode of regulation in the face of internationalisation, financialisation and sharpening external constraints on national models of development (Grahl and Teague, 2000). It is also reflected in literature on the 'colonisation' of regulatory space, which emphasises worker agency (Shibata, 2016) and multiple spatial regulatory scales or the polymorphic nature of regulation (MacKenzie and Martinez-Lucio, 2014; Pernicka et al., 2016). The colonisation of regulatory space is no longer confined within national boundaries but has extended in scope and scale and become more complex. As highlighted by Inversi et al. (2017, p. 294) too, regulatory space can be both 'occupied' and 'contested' over time by actors concerned, so introducing a historical or polyrhythmic dimension to regulatory change and the coalition of actors involved.

In this article regulatory change in engineering construction is explored through key themes—the mode of regulation, regulatory space, labour agency and coalitions of actors. Given the diversity of the construction sector, account needs also to be taken of the variegated, uneven nature of capitalist development and the significance of different product and labour markets (e.g. Brown, 2008; Lane and Wood, 2009; Peck and Theodore, 2007). The article shows how the regulatory space inhabited by

the rare example of a surviving collective agreement has been transformed over time as joint union and employer governance became embedded at different levels—site/project, sectorally, nationally and transnationally—and how in the process the coalition of actors involved—employers, unions, state and clients—changed, with worker agency playing a greater role. At the same time, the rationale for NAECI shifted from productivity bargaining to setting and maintaining labour standards.

### 1.1 Conceptualising change in labour regulation

While in the 1960s Flanders' regarded labour regulation as extending from legislation through to accepted 'custom and practice', his focus was predominantly on national collective agreements. This is evident in his seminal work on *Fawley Productivity Agreements* (1964), referring to changes enacted in the 1950s and 1960s at Fawley Esso Oil Refinery engineering construction project with the introduction of the 'blue book', the same term now applied to NAECI. The original 'blue book' centred on eliminating overtime in favour of a regular working week, regrading related to 'craft' status to overcome demarcation disputes and productivity bargaining. Between the 1960s and today, this concept of a sectoral agreement has been demolished. Indeed, as Visser (2005, p. 24) wrote, 'the sectoral agreement may survive ... but only by denying itself the characteristics that have defined [it]'. The transformation in the nature of collective agreements has gone together with a change in coordinated bargaining across Europe, especially since the 2009 crisis, as union and employer association membership has declined (Gooberman et al., 2019). The governance capacity of sectoral agreements has been undermined in favour of those concluded at company level, posing major challenges for industrial and transnational forms of wage coordination and denoting a fundamental shift in the mode of regulation (Marginson, 2015, pp. 98–99).

Neoliberalism has precipitated a wider capitalist restructuring of regulation, whose architecture depends on the dynamics of 'global' influences (Hyman, 2001, p. 474). In the UK, this has entailed a shift to limited individual legal rights, enforced piecemeal by inspectorates or courts and largely replacing the voluntary system based on collective social partner rights (Dickens, 2009). The private sector is predominantly nonunionised, including building and civil engineering, with only limited enterprise bargaining. In this respect, the regulation of labour relations in engineering construction represents a disparate mode of regulation, symptomatic of internal diversity within the construction industry. Disparities in labour regulation can nevertheless co-exist, representing specific historical legacies, the uneven, 'variegated' nature of capitalist development, and/or different product markets (Brown, 2008; Jessop, 2011; Peck and Theodore, 2007). However, disparate forms do not exist in isolation but interact, although occupying different spatial and temporal spheres, reflecting not only the variegated and polymorphic nature of capitalist development but what Ernst Bloch termed its 'polyrhythmic formation' (Durst, 2002).

Articulation across multiple spatial spheres, both multilevel and multidimensional, has become critical to the occupation of regulatory space (Dundon et al., 2014). Union action takes place at different levels—site, sectoral, national, regional and global—interlinked and articulated in various ways (Pernicka et al., 2016). This is especially relevant to engineering construction, given its attachment to a specific location and, at same time, global nature, where major one-off projects involve substantial financial risks, usually on the part of the state or region, which might be

transferred downwards towards individual workers through an extended contractual chain (Bryan et al., 2017; Fellows and Liu, 2012). As Lillie (2010, p. 687) and Wagner and Lillie (2013) argue, globalisation of capital and free movement of labour have created 'spaces of exception' so that construction employers can 'exploit deterritorialised sovereignty' through extensive subcontracting and agency labour, bringing workers across borders to sites while isolating them from local labour standards. It is in this context of fragmented global governance with dwindling regulatory control over capital that NAECI plays a role, potentially taking 'wages out of competition', preventing a 'degrading race to the bottom' in employment conditions and upholding quality standards (Brown, 2008, p. 115).

Within a multiscalar approach, MacKenzie and Lucio (2014) provide a framework for understanding the dynamics and complexities of regulation today, in contrast to the predetermined hierarchy of levels assumed in the past:

Regulatory change involves a variety of actors and relations that develop across time and contribute to an experience of regulation based on alliances, networks and micro-political processes. In reality, regulation is dependent upon a range of processes, and its transfer as a function between actors is not always clear, unilinear and 'negotiated' (189–190).

The suggestion is that a different coalition of actors exists under disparate forms of labour regulation, echoing Kornelakis (2014), who, in his application of a coalitional perspective to wage bargaining in the Italian and Greek banking sectors, found that labour-state coalitions have become critical to institutional survival. Earlier work, such as Frege and Kelly (2004), emphasises the significance of union strategies in labour regulation, while Shibata (2016) calls for recognition of workers' agency as capital restructures. Brook and Purcell (2017, p. 20) also affirm that institutions 'are simultaneously reproduced and transformed by the actions of the actors that inhabit them'. Finally, Inversi et al. (2017, p. 296) argue for an 'actor-centred approach' to regulation, which investigates roles, competences and accountability of the 'players' across multilevel pathways in time and space, to better understand the redistribution of power among actors and labour regulation complexities.

To understand changes in the mode of labour regulation in engineering construction, therefore, it is necessary to understand the complex articulation between different levels, the interplay between the various actors concerned and their changing coalitions. The considerations here—the nature of regulation within the context of the variegated, polymorphic and polyrhythmic development of neoliberal capitalism, the colonisation of regulatory space, deterritorialised sovereignty and the actors involved including the agency of labour—provide a framework for understanding how collective bargaining remains in place in the global engineering construction industry.

## 2 METHODOLOGY

The article applies a case study research design, focused on engineering construction, to ascertain why and how labour regulation has changed over the past decades through exploring the introduction, implementation and subsequent development of NAECI. More specifically, the objectives are to identify changes in (i) the coalition of actors involved, particularly employers, unions, workers, state and client; (ii) the implementation of NAECI and (iii) articulation between different levels—site, industry, national and global.

In order to address the first objective, to ascertain the changing coalition of actors, data were drawn from 10 oral history interviews conducted between 2010 and 2015 with former Sizewell A construction workers (Wall et al., 2012). Together with an interview with a former National Economic Development Office (NEDO) official, instrumental in formulating and negotiating the original NAECI, these provided detailed and valuable insights into conditions on engineering construction projects in the 1960s prior to NAECI. To understand more recent developments, union officials facilitated engagement with the Engineering Construction National Shop Stewards Forum and an Electrical Contracting Industry Sub Committee. This involved participation in five forum sessions between 2008 and 2017, which allowed for informal discussion and brief interviews with shop stewards. Shop stewards from engineering construction sites, including power stations, from across the UK and the national officers responsible for engineering construction attended these Fora.

Data with regard to meeting the second objective—to understand changes in the implementation of NAECI—were drawn from 11 interviews conducted between 2007 and 2017 with national Unite union officials, an employer federation, an independent auditor and four government agency representatives—including the former NEDO official. In addition, between 2015 and 2017, approximately 200 documents were collated, indexed and analysed, including all agreements since 1981, union-specific communication, large site and supplementary project agreements (SPAs).

To address the third objective, referring to multiscalarity, interviews were conducted at European level with a GMB European Office official and at site level through visits to Sellafield Nuclear Power Station, where 1,214 employees are currently covered by NAECI (NJCECI, 2019c). The first visit took place in 2011 and provided a vivid picture of NAECI implementation at project level, including through four interviews with contractors, a senior Unite organiser and two officials responsible for overseeing contractors. To arrange this visit was time-consuming, particularly passing security checks, and site entry was only allowed to a temporary building, with interviewees brought in at agreed times. Subsequently, a Sellafield Site Council meeting was observed, and further interviews conducted with a manager and union representative.

As a result of deploying these varying methods—interviews, visits, observation of meetings, documentary analysis—it was possible to evaluate the overall impact of NAECI and changes taking place over a 50-year period in this complex sector.

## 2.1 Setting up and implementing NAECI

Changes in wage relations and in the institutions supporting these denote shifts in the mode of regulation (Boyer and Saillard, 2001). Postwar problems associated with wage relations and the maintenance and development of a skilled workforce prompted the need for a new system of regulation in engineering construction. Before NAECI's introduction in 1981, differences in the wage systems of the building, civil engineering and engineering construction sectors were not extensive; through the gradual introduction of NAECI, disparities accentuated. Although stabilised through the social wage—annual paid holidays, a guaranteed 30 hours working week and an industry pension and sick pay scheme—the postwar union agreement to payment-by-results made for increasing 'havoc' throughout the construction industry (Clarke et al., 2012). The bonus, negotiated on site by shop stewards, constituted up to

100% of the direct wage and a wage drift had set in by the 1970s (Clarke and Janssen, 2016).

A graphic illustration of conditions before NAECI is Sizewell A Nuclear Power Station, commissioned by UK Atomic Energy Authority and Central Electricity Generating Board (CEGB) and constructed between 1961 and 1966 by a consortium of large, mainly UK-based, contractors (Wall et al., 2012). Despite the innovative, dangerous, untried and nontraditional nature of the project, the wage system revolved around the bonus, negotiated individually by shop stewards for each trade and based on output, such as the amount of pipework in the case of pipefitters. Echoing Korczynski (1993), an interviewee, originally employed as a steel erector then NEDO official, describes industrial relations as frustrating for workers and exploited by contractors:

Erectors working for one contractor might get much more than for the other, and so the differentials were always an issue. ... Nobody crossed the CEU [Construction Engineering Union] in those days, so we were in and out just like the rest of them.

The industrial relations system encouraged wide wage differentials, divisions between site and national levels and many disputes. In 1965, days lost to strikes in engineering construction were 911 per 1,000 workers, with wages the cause of 41% of stoppages (Murray and Langford, 2003).

The power that the bonus system gave shop stewards represented a defining feature of pre-NAECI industrial relations, one persisting subsequently in the building and civil engineering sectors. As expressed by a former Sizewell steel erector and later CEU official:

Every major site had senior shop stewards that were little General Secretaries on their sites, many of whom never played any part in the union, union's activities, branch life, conferences, or anything like that. They were just quite happy to be shop stewards on their contracts, where they wielded tremendous influence with their sites. They set standards, in many regards, for the other major sites in the industry. (Interview, Greg Douglas)

The numerous disputes over wages and overtime associated with the bonus system led to government concerns about productivity on the industry's large state-financed infrastructure projects. This was reflected in the 1970 *Large Industrial Sites* report of the National Economic Development Council (NEDC), a corporatist economic planning forum supported by NEDO and bringing together management, unions and government to address Britain's relative economic decline. NEDC revealed that in the 1960s, when approximately 50,000 workers were employed on such sites, 70% of whom were skilled, 20% semiskilled and only 10% unskilled, 83% of projects experienced delays (Korczynski, 1997; NEDC, 1970).

The *Large Industrial Sites* report highlighted one major distinguishing feature of engineering construction: its high skill level. Engineering construction occupations include electricians, mechanical fitters, platers and riggers, each requiring formal training. Before the 1990s, engineering construction training came under the tripartite Engineering Industry Training Board (EITB) rather than the Construction Industry Training Board, which covered the rest of construction. Both Boards had a statutory right to raise levies from firms and equal representation of employers and unionists plus educationalists. In 1972, however, the EITB moved to a levy exemption as opposed to levy grant system, with small firms exempted from paying.



Following publication of the *Large Industrial Sites* report and the demise of the 1971 Industrial Relations Act, NEDO set up a Large Sites Action Group. The CEU, backed by EEPTU (Electrical, Electronic, Telecommunications and Plumbing Union), took up the Group's proposal for a National Joint Council (NJC) for the engineering construction sector. A booklet entitled 'What's wrong on site?' was circulated in the pay packet of all men on sites. Subsequently, CEU National Conference passed a resolution for one national agreement for engineering construction, endorsed by the other unions. Both NEDO and the employers' associations—the Oil and Chemical Plant Constructors' Association (OCPCA), the EEF (Engineering Employers Federation) and the Site Contractors' Policy Committee, later (in 1982) the National Engineering Construction Employers' Association—took this up. Mass meetings were organised by NEDO around the country, addressed by a contractor, a client and a unionist.

Initially small firms and subcontractors opposed standardisation of wages and working rules (Korczynski, 1997), and only in 1981 was NAECI or the 'blue book' concluded between unions (Amalgamated Union of Engineering Workers, EEPTU, Amalgamated Society of Boilermakers, Shipwrights, Blacksmiths and Structural Workers, Transport and General Workers' Union and the National Union of Sheet Metal Workers, Coppersmiths and Heating and Domestic Engineers) and employers' associations (EEF, OCPCA, and Thermal Insulation Contractors Association) and signed at the Trade Union Congress. It has since been periodically updated, the latest being 2019–20 (NJCECI, 2018). The results of implementing NAECI were soon apparent; by the 1980s, only 15% of projects experienced delays (Korczynski, 1993).

With NAECI's introduction, intended to centralise wage relations, increase productivity and establish a new institutional support structure through a coalition between contractors, clients, unions and the state (Kornelakis, 2014), the position of the shop stewards changed fundamentally. In contrast to MacKenzie and Lucio's (2014) argument concerning the 'containment' of unions through employer colonisation of regulatory spaces, national union collective organisation was underpinned, as described by interviewee Greg Douglas when the draft national agreement was presented to the CEU annual conference in Buxton:

... the unity of purpose that it would bring us, the solidarity, it would bring the whole union under one agreement; it would give us greater negotiating power; ... greater equality to the workers; greater safety provisions; forums to discuss problems ... on joint disciplinary panels. All the things that ... were necessary, that we did not have before, were all incorporated into this document. It was a marvellous agreement for the time, and the conference overwhelmingly endorsed it. The only division that opposed it was the London Division ... mainly, they considered ... that it would destroy the shop stewards' movement, the only real powerhouse that the union had. Our argument was that we could use that shop stewards' movement at the appropriate annual negotiation times in order to gain benefits on behalf of all the members and not just the large sites.

Thus, while stigmatisation of labour representatives in the 1960s and 1970s acted as a precursor to colonisation, leading to union marginalisation and containment in building and civil engineering and many other industries, engineering construction saw unions and employers' associations negotiate the centralised NAECI, although this 'contained' workplace representatives and left little space for informal actors.

Through NAECI, the engineering construction industry's regulatory space was transformed. The agreement set into motion an architecture of industrial relations for engineering construction operating today, especially its multiscalarity and centralisation (Emery, 2015). At national level, in addition to government and client,

is the NJC of employers and unions, administered by an executive and independent chair and with wide-ranging powers, including interpreting the agreement and ruling on any disagreements, categorising work, approving the SPAs required for each project and adjudicating if grievances and disputes cannot be resolved locally. The SPA relates to specific aspects of each site, including areas excluded from the scope of NAECI coverage and the scope of the Project Joint Council (PJC), which manages application of NAECI at site level and agrees project performance. At a Sellafeld PJC attended, unionists and employers met separately and then together, discussing current issues of concern, including health and safety. In 2015, the NJC introduced a registration system to approve employers to use the NAECI for all 'in scope' engineering construction activities, including Category 1 (Major) and 2 (Repair and Maintenance) projects (NJC, 2014). Clients and contractors can register their work for NJC approval provided they meet the criteria of compliance with NAECI terms and conditions.

Finally, an important part of local regulatory arrangements on major projects is an auditing process to aid project financial stability and 'industrial harmony' (Auditor interview). Following the signing of a SPA on large Category 1 projects, an independent auditor, mainly client-funded, is appointed to scrutinise, among other items, individual wage levels of all workers. This enables the client and PJC to monitor the compliance of project contractors with NAECI and the SPA. The identification of individual wage slips only occurs if a discrepancy with NAECI-agreed payments exists.

## **2.2 A changing coalition of actors**

As noted by Brook and Purcell (2017), institutions and industries are dynamic social phenomena and transformation is through the actors involved. Below the surface since 1981, the roles of the actors propping up NAECI have changed, with the first major shift occurring in the early 1990s as the state became more distant as regulator of industrial relations. Securing the original agreement relied on significant state involvement through the EITB, NEDO, and, as public client, the CEGB. In 1991, the tripartite EITB was disbanded and the statutory ECITB was set up, with levy-raising powers but just two union representatives (Department for Education and Skills, 2003). The Thatcher government also increasingly ignored and then abolished NEDO and privatised the CEGB, so important as client and legitimiser of the NAECI. As a senior Unite official explained, 'The CEGB upheld the agreement [and the] employers adhered to it'. CEGB privatisation led to a burgeoning client and major/managing contractor role for multinationals, present since the 1970s, but not dominant (Domah and Pollitt, 2001). The company *Électricité de France* (EDF), active in power generation, distribution, design, construction and dismantling, largely owned by the French state, and the world's largest producer of electricity, exemplifies the current situation.

On the employers' side, by the early 1990s, OCPCA joined with National Engineering Construction Employers' Association to form the Engineering Construction Industry Association (ECIA) and EEF abandoned multiemployer for single-employer bargaining and 'the management prerogative' (Purcell, 1991), ceasing its previously significant role in maintaining the agreement. With multinational dominance, contractual relations between client and contractor became less direct and finance and project management decision-making moved onto a global level (BIS, 2009; Bryan et al., 2017). Today ECIA, with a membership of 300 predominantly global

companies and a very different institution from the traditional employer association representing nationally based companies, is the key employer body to safeguard NAECI. The largest UK construction company remaining is Balfour Beatty, while smaller enterprises tender for minor contracts. This increasing globalisation of clients, companies and the main employer association, together with the liberalisation of energy, signifies the entry of new actors and regulatory boundary changes (MacKenzie and Lucio, 2014).

A significant change in the unions also occurred in the early 1990s, especially following the Amalgamated Union of Engineering Workers and EETU merger to form the Amalgamated Engineering and Electrical Union. Today just two trade unions (Unite and GMB) are partners in the NJC, together with ECIA and two other employers' associations. As guardians of workplace-negotiated regulation, unions have sought to enforce regulation on multiple scales and not been 'out manoeuvred' by new management strategies or marginalised and contained by government efforts. This is evident from the strategic engagement of the engineering construction sector shop stewards, representing a further response to mounting challenges from 2000 onwards and a significant change in the regulatory space NAECI inhabits:

... in 1999 the old brigade ... there since 1981 ... would live too much in the past. They would do the negotiations, did not involve the shop stewards ... and we just got a [wage notification] telex around Christmas ... when the men came back. ... Since 2003 we developed the [national] shop stewards' forum that's been the life-blood of engagement with the workforce and the trade union activists. (Interview: Unite National Officer)

The original intention of the centralised NAECI was to contain a local shop stewards' movement organised through 'cabin' and worker militancy on sites (Korczynski, 1993). But although NAECI succeeded in institutionalising local negotiation, mainly through PJs, this accentuated a detachment between the membership and the national union. New national officials instigated a more 'structured' approach to membership engagement, central to which was setting up the National Shop Stewards Forum in 2003, which is now critical to maintaining the agreement (Unite National Officer). The Forum convenes over two days three times per year, involves both GMB and Unite members and gives a strong national framework to local engagement with shop stewards and members as well as encouraging informal contact between meetings. As explained by the Unite National Officer in 2017, the purpose was to

... give more accountability ... involving stewards in the decision-making and also in the pay negotiations. This year there were two full-time officials and six lay shop stewards who will lead the negotiations.

Outside official channels, union members have also succeeded in coordinating to maintain NAECI rights through 'unofficial' action (Gall, 2012).

Thus, while in the first years of the new millennium, the edifice had appeared shaky, a strong architectural prop was provided by the union leadership. The new coalition of actors in place—global employers and clients, national unions and shop stewards—often working closely with the state has changed the colonisation of regulatory space and given greater prominence to worker agency. It has sought to take wages out of competition and protect the industry from the encroachment of conditions prevalent elsewhere.

### 2.3 The changing mode of regulation

Pertinent to understanding this actor-centred change in engineering construction are the accusations raised between 1998 and 2008 that engineering construction productivity lagged behind the US Gulf Coast by 11% and mainland Europe by 5% because of inadequate schedules, poor project controls and excessive engineering and construction overlaps (Independent Project Analysis, 2009). Reports highlighted poor employment practices and inadequate training associated with reduced levels of productivity, including aspects common to the rest of construction: casual and indirect employment; low skill levels requiring considerable supervision; poor site management and the NJC's narrow role (ECITB, 2005). It was therefore recommended that the training levy apply to all UK NAECI-based companies, apprentice numbers be doubled through government contributions, training given to line management, and NAECI fully implemented (BIS, 2009).

These recommendations are significant in attributing low productivity to a failure to maintain standards in terms of employment conditions and skills, and not, as earlier perceived (Ahlstrand, 1990) directly to low output levels per worker. In this respect, NAECI was seen as key to improving and upholding standards even though the weakened skill base is attributable to the ineffectiveness of the employer-based VET system under ECITB rather than to NAECI implementation. Engineering construction employment has been estimated to expand by about 33,000 jobs between 2016 and 2026 (ECITB, 2017). Yet in a survey of 829 engineering construction companies, employing 147,000 workers, 81% complained of 'lack of knowledge, experience and practical skills in applicants' (ECITB, 2019a, p. 7). Much of the existing workforce requires further training and apprentice starts were just 641 in 2018 (ECITB, 2019b). The reality in one of the most dangerous, technologically demanding and infrastructure-significant industries has therefore been decreasing levels of VET, severe skill shortages and greater reliance on European-wide subcontracting and posted workers.

Challenges to the agreement have intensified since 2000, wrought by extensive and global subcontracting and involving increased use of foreign posted workers, whether employed by contractors or subcontractors, coming through an agency or self-employed (Fitzgerald et al., 2012). The Posted Workers Directive (PWD; 96/71/EC) regulating the movement of labour (posting) across the European Union details only 'minimum' provisions to protect workers. An implied intention of the PWD was to ensure equal treatment and nondiscrimination, with social partners in different countries comparing home and host conditions and applying the most beneficial, in a process requiring employer agreement and a favourable policy framework (Cremers, 2010). The accession of the Central and East European (A8) countries in 2004 and pervasive liberalisation pressures (Hauptmeier, 2011) have challenged prevailing policy environments, provoking 'half-hearted' employer and state responses in construction (Lillie and Greer, 2007, p. 553).

Given this situation, union strategies (Frege and Kelly, 2004) and worker agency (Shibata, 2016) assumed ever more importance and in 2009 became 'globally' evident through the oft-quoted "British jobs for British workers" slogan. In 2004–05, the unions highlighted challenges posed by the posting of workers and disputes arose, for instance at Cottam (Lincolnshire) where unionists struck for five weeks in support of a Hungarian colleague (National Engineering Construction Committee, 2004, 2005; Unite interview). As detailed by Gall (2012), in 2009, disputes occurred at the

Lindsey oil refinery and at Staythorpe and Isle of Grain power stations, where two Spanish subcontractors (Montpresa and non-ECIA member FMM) refused to consider employing local UK-based labour. On these and other sites, UK-based labour was by-passed, leading Unite to call on government to insist companies applying for contracts on public infrastructure projects sign up to Corporate Social Responsibility agreements committing to fair access for local labour (Barnard, 2009). The disputes

...highlighted the problems and frustrations with regard to redundancies, as the recession was beginning to have an impact. People felt that they were being discriminated against as employers would not employ local labour. [This is about] ... people being bought in from cheaper wage countries, its wage dumping. (Interview, Unite National Officer) At Ferrybridge Multifuel 1, the Swiss general contractor Hitachi Zosen Inova used foreign subcontractors, despite the express intention to subcontract to local and UK companies wherever possible. One Croatian subcontractor, when challenged by GMB and Unite for paying its workforce below NAECI rates, was forced to 'top up' wages paid, although after project completion the company reclaimed this 'top up' from posted workers. In 2015, large numbers of construction workers protested outside biomass power stations. At one, the global contractor Babcock & Wilcox Vølund refused to include the project under NAECI and subsequently subcontracted the boiler construction to the same Croatian firm, with a tender based on Croatian wage levels, well below NAECI rates. This exemplifies Lillie's (2010) variegated sovereignty and the problem of projects constructed outside the national agreement. In 2011 and 2012, GMB and Unite unionists demonstrated against non-NAECI terms and conditions offered to workers at the Exxon Mobil plant at Fawley. Hinkley Point nuclear power station, too, has a separate agreement, one echoing NAECI and also embracing civil engineering (EDF, 2013a, 2013b). All these incidents contributed to the requirement in 2015 that projects be registered in order to ensure standards are maintained in full because

Unscrupulous Clients and Contractors have been pirating the NAECI without the consent of the NJC which has resulted in a cheaper deal for them as they have been picking and choosing which terms to make available to their employees and have not been applying all of the NAECI terms and conditions. (NJCECI, 2019d) At forum meetings attended, persistent complaints were made about low training levels, the introduction of cheap labour and lack of equality of opportunity for UK workers. While disputes have strengthened workforce solidarity, one reason for them has been weaker NAECI implementation, resulting in the encroachment of employment practices from the rest of construction and epitomising the polyrhythmic nature of development.

### 3 MULTISCALARITY

The engineering construction disputes exemplify the importance of multiscale analysis as the global sharply meets the local and disputes, negotiations and changes to NAECI have ensued. At different levels, the unions have sought through various means to maintain compliance and enforcement, such as by pursuing firmer linkages with unions elsewhere in Europe, including Confédération Générale du Travail in France and Croatian and Danish unions. They have campaigned to convince national government that the PWD account for sector-prevailing employment conditions, and, where appropriate, collective agreements (Novitz, 2010). Campaigning documents have been published (e.g. National Engineering Construction Committee, 2004, 2005; Unite, 2009) and leaflets, posters, sticker 'resources' and website produced, dedicated to revising the Directive following European Court of Justice judgements. In accordance with MacKenzie and Lucio's (2014) evaluation of the changing state role, UK government's response has been 'hands off', as was evident during an interview with a Department of Business, Innovation and Skills policy officer responsible for posted workers, who explained that the Liaison Office she administered was

... not an inspectorate or anything else like that; all we are really is a mailbox so if other countries want to find out about companies or people posted to their countries from the UK they can. We can give them very limited bits of information.

Since Lindsey, direct reference to non-UK-based workers is included in NAECI:

The non-UK contractor will be made aware of the content of the SPA and comply with its contents... have the knowledge and capability to correctly run a NAECI payroll (and) responsibility to comply with NAECI with particular attention to Audit. (NJCECI, 2015)

Although auditing has been in place on large projects since the early 1980s, as the workforce has become increasingly mobile and international, with teams of foreign posted workers arriving on site, it has become critical as a linkage between local, sectoral and global levels (Lillie, 2011; Pernicka et al., 2016).

Although tripartite national responses have diminished, union action to enforce national regulation and collectively agreed terms and conditions has increased, enhancing solidarity and interlinking national, regional and local levels through the National Shop Stewards Forum. However, there are ongoing challenges symbolised in European Court of Justice PWD rulings, which exemplify the 'spaces of exception' that can undermine existing national regulation (Lillie, 2010, 2011; Wagner and Lillie, 2013). While acknowledging the legitimacy of union action, the rulings require that this is proportionate to the case in hand, so marginalising the right of unions to undertake industrial action and limiting national legal support (Viking Case C-438/05 and Laval Case C-341/05; Luxembourg C-319/06 and Rüffert C-346/06). Subsequent European Commission proposals to reconfigure the PWD have hardly met construction union concerns across Europe that free movement should not mean superseding national social rights (European Trade Union Institute, 2016).

At site level, one response to productivity challenges has been far-reaching changes to the labour process. As this has become more complex, requiring greater know-how, abstract competences, and coordination between different occupations, integrated teamworking has become prominent rather than the trade-based or craft-based divisions and hierarchies that characterised the engineering construction labour process when NAECI was first introduced (Clarke et al., 2013; Young, 1986). The Major Projects Agreement Forum for the mechanical and electrical sectors officially endorsed integrated teamworking in 2003 (Joint Industry Board, 2003, p. 7), stipulating 'operational flexibility within the competence level of each Team Member'. This is echoed in the NAECI-inspired Common Framework Agreement for Hinkley Point Nuclear Power Station, where integrated teamworking is seen as facilitating 'highly productive working' (EDF, 2013a, p. 4), the aim being 'to achieve and sustain high standards' (EDF, 2013b, p. 22). While not yet forming a common approach to major project construction, with discrete task working enforced by subcontracting, it does exemplify how NAECI and its union-employer custodians have negotiated their way to new ways of working.

A further adjustment at project level has been greater use of SPAs, ratified by the NJC, overseen by the PJC and facilitating workplace (project) flexibility while maintaining union regulation. SPAs are not to be confused with company level agreements (Marginson, 2015), as they include any incentive bonuses and unions closely regulate individual performance enhancement. Indeed, multinational clients have had little success in their ongoing attempts to reframe regulatory boundaries or abandon NAECI by trying to enact alternative procedures linked to performance on particular projects.

These challenges—the globalisation of the labour force, posting disputes and poor NAECI implementation, productivity and VET—and responses to them—the acceptance of integrated teamworking, increased use of SPAs for workplace flexibility and

compliance required of non-UK contractors—symbolise the readjustment of regulatory space at different levels. The agreement has evolved over the years and met successive boundary challenges and yet remains a centralised agreement, negotiated between unions and employers, with controls over wage rates, bonuses and projects themselves through SPDs, PJs and the auditing process. Considerable challenges remain, including the weakness of the VET system, meeting the greater qualification and skill requirements demanded by a transforming labour process, integrated teamworking, widespread subcontracting, the use of agency labour and the financialisation of construction companies.

#### 4 CONCLUSIONS

The origins, implementation and subsequent modifications to NAECI reflect changes in the mode of regulation and in the production and labour processes. The pillars of the industrial relations edifice have moved and been materially transformed, boundaries shifted, and the architecture assumed a new shape. At the same time, the agreement has been challenged, including through changing contractual relations, global labour mobility, productivity concerns, VET and skill weaknesses.

One of the most important reasons for the agreement's survival is its adaptability through the changing coalition of the actors involved, supporting the relevance of Kornelakis' (2014) coalitionist approach. Changes in the roles of global, national, regional and local parties illustrate the dynamic and polymorphic character of regulatory space. While there exist similarities with the building and civil engineering sectors, including the use of agency labour and the employer-led VET system, differences in stakeholder roles are considerable. Without, for instance, the agency of labour and supportive union strategies, it is difficult to imagine how NAECI might have survived the dramatic disputes of 2009. In this respect, the case confirms Shibata's (2016) emphasis on the importance of worker agency and Frege and Kelly's (2004) on the significance of union strategies. Worker agency has been critical to addressing challenges through union campaigning, adjustments to the centralised character of the agreement, the establishment of a National Shops Stewards Forum, the PJs covering all major sites and the recognition of new ways of working.

Also important for NAECI's survival is the continued support of employers and clients, attributable in large part to the high risk, complex, and high-quality standards associated with the product, necessitating coordination of diverse organisations and drawing on a wide range of expertise (Fellows and Liu, 2012). The rationale for the agreement has shifted from improving output, through for instance wage incentives and productivity bargaining, to maintaining labour standards. NAECI serves as an important instrument of 'colonisation', setting industry boundaries or 'scope' and upholding standards and, in so doing, taking the industry's products 'out of competition' (Brown et al., 2008). As a result, Brexit may have little significant impact on NAECI implementation. A weak spot nevertheless remains its inability to regulate the reproduction of the highly qualified labour force employed, which would require a transformation of the VET system through substantial state support.

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