

## **Technical Report: June 2018 CKE 1**

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**Human Resources Professionals Association**

3 August 2018



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# Executive Summary<sup>1</sup>

*Note that this technical report covers only the primary new form or forms administered during an administration, and not detailed results for all forms used (which may include previously used forms, scrambled forms, and other modifications to maintain exam and score integrity).*

The Comprehensive Knowledge Exam 1 (CKE 1) was administered to 203 candidates using computer-based testing at Prometric test centres June 4–18, 2018, inclusive. The examination comprised 175 four-option multiple choice items and had a 3½-hour time limit.

As per the CKE 1 blueprint, the exam was scored using the 145–155 best-performing items (while adhering to the prescribed distribution across functional areas). The mean score for first-time candidates ( $n=157^2$ ) was 102.0 (68.0%), and for all candidates it was 99.4 (66.2%), out of 150 scored items. Reliability was strong at .90. The final set of scored items adhered to the blueprint parameters.

The pass mark was set using equating back to the February 2018 and June 2017 administrations, yielding an integer pass mark of 97. Equating was conducted to compensate for minor changes in exam form difficulty so that any given candidate has an equivalent hurdle regardless of when they write the CKE 1. This pass mark resulted in a pass rate for first-time candidates of 66.2% and a pass rate for all candidates of 58.6%.

This report, the analyses performed, and the processes followed are consistent with NCCA standards<sup>3</sup> and ISO 17024 standards.<sup>4</sup>

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<sup>1</sup> This technical report is an abbreviated version of the full report. Information has been excluded that if known to candidates could negatively affect the validity of future candidate test score interpretations. This includes item-level statistics, some information about the construction of test forms, and some specific details concerning equating.

<sup>2</sup> Excludes those who had failed an HRP examination in the past, who were identified as being statistical outliers, or who had written an alternative test form.

<sup>3</sup> National Commission for Certifying Agencies (2014). *Standards for the accreditation of certification programs*. Washington, DC: Institute for Credentialing Excellence.

<sup>4</sup> International Organization for Standardization (2012). *ISO/IEC 17024:2012 Conformity assessment – General requirements for bodies operating certification of persons*. Geneva: International Organization for Standardization.

# Administration

## Form Setting

Using only validated test items, Wickett Measurement Systems prepared one 175-item test form (using a combination of scored and experimental test items). Wickett constructed the final test form according to the following parameters:

1. Including only items validated by the validation panel in the past year
2. Fitting the total item count of 175
3. Excluding enemy items
4. Matching the blueprint target value (+/- 2%) for each functional area
5. Maximizing spread across competencies
6. Reducing item exposure
7. Selecting items with perceived psychometric effectiveness, using statistics from previous administrations as available

Wickett proofed the final form for text errors and detection of potential enemy items. Items flagged as enemies were replaced.

The final form composition for the primary June 2018 CKE 1 form is shown in Table 1. All functional areas are within the limits of their targets, and as such, the form reflects the blueprint (see Appendix A for the CKE 1 blueprint).

Note that at any administration, HRPAs make use of previously validated and administered test forms along with new test forms, in addition to employing other mechanisms to maintain the integrity of the exams and candidate scores.

Table 1: Test form as administered

	Functional Area	Actual Items	Target	Variance
10	Strategy	7	7	—
20	Professional Practice	19	19	—
30	Organizational Effectiveness	23	23	—
40	Workforce Planning & Talent Management	23	23	—
50	Labour & Employee Relations	19	19	—
60	Total Rewards	23	23	—
70	Learning & Development	23	23	—
80	Health, Wellness & Safe Workplace	19	19	—
90	HR Metrics, Reporting & Financial Management	19	19	—
	<b>TOTAL</b>	<b>175</b>	<b>175</b>	<b>—</b>

## Testing Window

The examination was administered via computer-based testing at Prometric test sites primarily in Ontario. The testing window was June 4–18, 2018, inclusive, and 203 candidates wrote the exam.

Candidates had access to a basic-function calculator on screen. No other aids or resources were allowed.

# Analysis

## Data Cleaning and Integrity Checks

Prometric provided data in .xml format via a secure ftp site. Candidate files were provided as candidates completed the examination throughout the testing window. These files were extracted to Microsoft Excel for processing. They contained identifying information for each candidate, form information, start and stop times, answer string, key string, candidate total score, item comments if the candidate made any, and time spent per item.

The data files received were reconciled against the roster provided by Prometric to ensure that all .xml files had been received. Further, each candidate total score as computed by Prometric was reconciled with that computed by Wickett for the full set of 175 items to verify key accuracy. Comments on items were also reviewed to identify any specific item-level issues. No problems were encountered. One candidate who experienced difficulties with viewing items expressed this concern in item comments; this issue was evaluated separately.

The average time taken by all candidates was assessed to detect potential examination timing concerns. The distribution is shown in Figure 1. The mean was 2 hours, 32 minutes (3 minutes less than in January 2018). The time limit on the CKE 1 was 3½ hours, suggesting that time was not a factor in scores across candidates.

Nine candidates (4%) took the full 3½ hours, suggesting that those candidates may have wanted more time, and 2 candidates (1%) left at least 1 item blank, suggesting that those candidates timed out of the exam before being able to complete it. These metrics will continue to be monitored, but at present do not appear problematically high.

The correlation between scores on the 175 items and time spent writing the examination was negligible at a value of  $-.01$ , suggesting that time constraints were not generally an issue for candidate performance. (Note that 3 candidates exceeded the time limit; these candidates were granted additional time in advance of the administration as an accommodation.)

Candidate scores across the window were computed to look for any evidence of item exposure. As shown in Figure 2, there was little variation across the window, and the difference between the first 3 days and the last 3 days was a drop of 0.9 marks out of 175.

As a matter of interest, candidate volumes were also examined across the window; these are also shown in Figure 2. Though not psychometrically meaningful, there is a clear pattern for candidates to prefer to book at the end of the window rather than the start.

Figure 1: Examination time distribution for all candidates

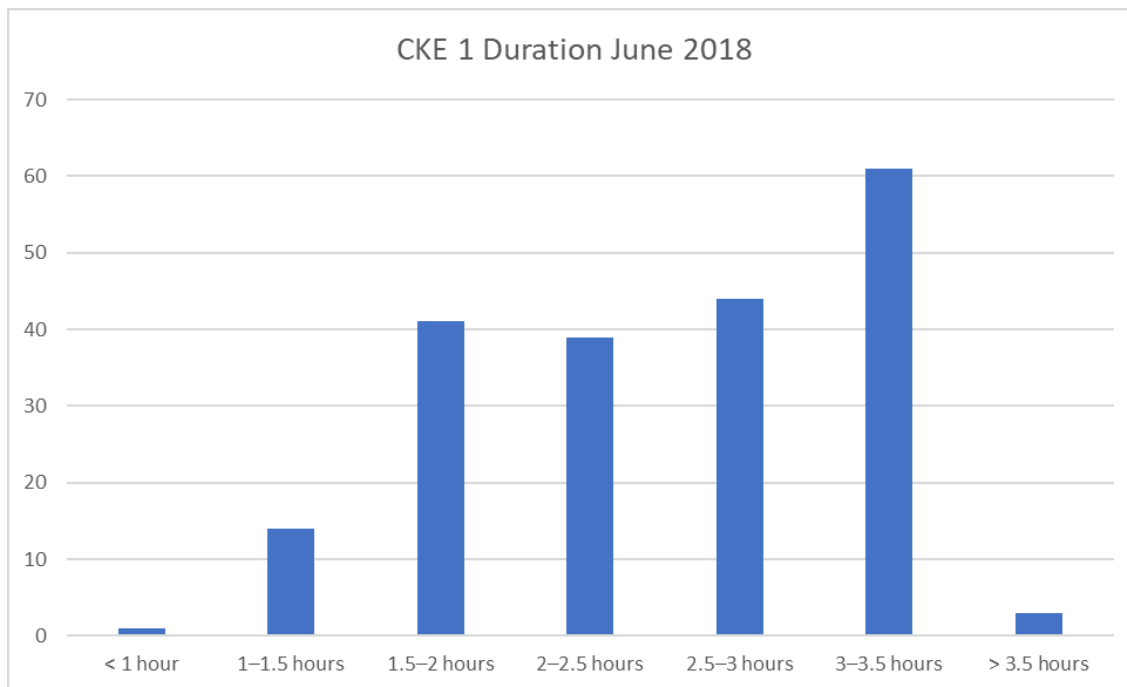
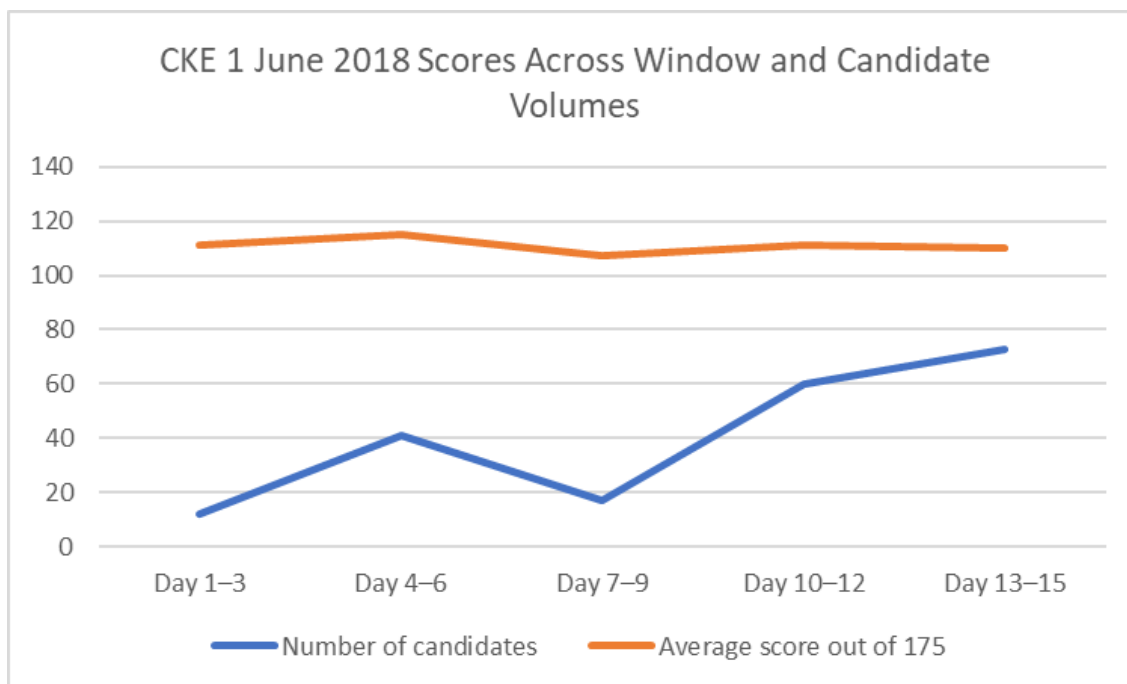


Figure 2: Candidate volume and score trends across testing window



After removing candidates who were administered a previously used test form (who were scored using the same decisions employed at the time that form was originally used), scores were calculated for all remaining candidates based on the full set of 175 items. One candidate was flagged for an abnormally low or high score (z value outside  $\pm 3.0$ ). Also, the 175 items



were arbitrarily broken into 7 blocks of 25 items for each candidate; the 7 resulting subscores for each candidate were evaluated for outliers as well. For candidates with any subscore more than 3 standard deviations (SD) from their average z-score, the .xml file was examined closely for any issues. All outliers were removed from initial analyses; candidates with abnormal response patterns were also removed. Candidates who left 5 or more blanks were also flagged for removal from analysis. To be conservative, candidates who had been granted a testing accommodation were also removed from the main analysis (simply because their testing conditions were not the same as the main group of candidates, even though each accommodation was granted on the premise that it would make the testing experience equivalent in terms of opportunity to demonstrate competence). As a result of all of these factors, 5 candidates were removed from analysis.

Candidates who had failed a previous HRP A examination (CKE, CKE 1, or CKE 2) scored lower than did those who had not (57.9% and 65.2%, respectively, on the full exam of 175 items). This difference was meaningful and significant ( $t(85)=5.20, p<.001$ ). In keeping with standard procedures, these candidates were removed from subsequent analyses. The CKE 1 analysis proceeded with 157 candidates.

Owing to the modest number of candidates, all subsequent analyses were interpreted with caution.

## Post-Examination Survey

Candidates were provided access to the post-examination survey immediately after submitting their responses to the CKE 1; 200 responses were obtained from candidates (response rate, 99%).

Table 2 shows the responses to the administration-related questions. Note that candidates were generally very positive about the administration experience. Table 3 shows the content-related questions; there was a tendency to more neutrality on these questions. The rating for perceived fairness (Question 14) warrants monitoring as it continues to be low.

Candidates were asked to express their opinion regarding whether completing the examination on a computer affected their performance. Table 4 shows that more than half of candidates felt it made no difference, and that where a preference was expressed it was in favour of using a computer.

An open-ended question was also posed to candidates asking for any additional comments. Those comments were provided to HRP A for information and consideration. Nothing in the comments or survey data raised concerns about item analysis or scoring.

Table 2: Administration-related post-examination survey questions\*

	Question	SA	A	N	D	SD	Score	Agreement
1.	I was able to book a seat to write the examination at a time that was convenient for me.	112	65	9	10	4	4.4	89%
2.	I was well informed about what documents to bring to the exam location.	148	49	1	3	0	4.7	98%
3.	Proctors enforced the exam-day rules and the security procedures at the test centre were what I expected.	148	47	2	2	1	4.7	98%
4.	Proctors were professional and courteous.	140	58	1	2	0	4.7	99%
5.	The tutorial helped me understand how to complete the examination on the computer.	127	62	8	1	1	4.6	95%
6.	Navigation through the examination was easy and intuitive.	117	73	5	1	2	4.6	96%

\*Response categories: SA = Strongly Agree; A = Agree; N = Neutral; D = Disagree; SD = Strongly Disagree.

Table 3: Content-related post-examination survey questions\*

	Question	SA	A	N	D	SD	Score	Agreement
7.	The time allotted for this examination was sufficient.	109	73	4	8	2	4.4	93%
8.	Information available prior to exam day provided me with adequate details about the content and format of the exam.	53	78	31	26	8	3.9	67%
9.	I feel I was adequately prepared to write this examination.	24	70	59	38	5	3.7	48%
10.	The questions in the examination were clearly written.	33	90	41	24	8	3.8	63%
11.	The terminology used in the examination was accurate.	35	113	39	6	3	4.1	76%
12.	The situations presented in the examination were realistic.	48	118	22	5	2	4.2	85%
13.	The questions in the examination reflected the examination blueprint.	27	76	64	15	4	3.9	55%
14.	The examination was a fair assessment of my ability.	28	67	63	28	9	3.7	49%

\*Response categories: SA = Strongly Agree; A = Agree; N = Neutral; D = Disagree; SD = Strongly Disagree.

Table 4: Preference regarding computer-based testing versus pencil-and-paper

Question	Count	%
I feel that completing the examination on a computer improved my performance.	51	26%
I feel that completing the examination on a computer decreased my performance.	38	19%
I feel that completing the examination on a computer had no effect on my performance.	106	54%

## Initial Analysis

The full CKE 1 examination was 175 items, of which approximately 150 were to be scored. The other 20–30 items were designated as experimental. However, because only one new form was administered, all items were potentially available for scoring and the focus of subsequent item analysis and key validation was on determining the best set of approximately 150 items that still reflected the examination blueprint.

The initial analysis summary statistics are presented in Table 5.

Table 5: Initial examination statistics

Index	CKE 1
Items	175
Total candidates	203
Candidates in analysis	157
Mean	114.1 (65.2%)
Range	67–150 (38.3–85.7%)
Cronbach's alpha	.89
Mean $r_{pb}^*$	.19

Standard classical test theory analysis was conducted to identify the following:

1. Item difficulty (percent obtaining correct result,  $p$ )
2. Item discrimination (corrected point-biserials,  $r_{pb}^*$ )
3. Distractor quality (based primarily on distractor discrimination)

Wickett compiled these statistics, along with any comments made by candidates concerning flagged items, to identify items that may have been keyed incorrectly or that were performing

poorly. Most emphasis was placed on the corrected point-biserials as evidence of item quality. Items were ranked from worst performing to best performing accordingly.

## Key Validation

Key validation was conducted via web meeting on June 26, 2018, using members of the CHRP Examination Validation Committee (EVC). The EVC (Table 6) was reminded of basic item and test analysis methods and was oriented to the main statistics used to evaluate the quality of the CKE 1.

Table 6: CHRP Examination Validation Committee members – Key validation

Member	Credential	Years of Relevant Experience	Years on EVC	Industry
Sunday Ajao	CHRL	15–20	1	Banking/finance
Claire Chester	CHRL	10–14	1	Regulation/CPA
Tanya Gopaul	CHRL	10–15	1	Banking
✓ Jean Lazarus	CHRL	15–19	1	Health services
Kriss Stone	CHRP	10–15	1	Real estate
✓ Ielean Tait	CHRL	15–20	1	Environmental
✓ Karen Weiler	CHRL	20–29	1	Software/ communications
✓ Alyssa Young	CHRL	5–9	1	Non-profit

✓ Participated in the session.

The group was informed that test reliability, as measured by Cronbach's alpha, was .89 based on the set of 175 potentially scored items and that this was above the generally accepted threshold of .80.

The group was walked through the flagged items one at a time, with the recommendation that the worst-performing items be removed from scoring, but they were given less direction on those with borderline statistics. Where available, candidates' comments about the items were also shown. The group made decisions based on content and the data through discussion; they removed the 25 items that they felt were least appropriate to retain for scoring. Because of the modest sample size for this administration, past item data were also used where available, and the group was directed not to rely unduly on statistics exclusively from the June administration. Panel members' comments about specific items were recorded for future item revision activities.

Not all remaining items were strong-performing, and several items were retained that were very easy or very hard or that had a low corrected point-biserial. Most were moderate to strong items, however. The final alpha for the set of 150 scored items was .90. The difficulties ranged

from 23.6% to 93.6%, with a mean of 68.0%. The  $r_{pb}^*$  values ranged from .04 to .46, with a mean of .23.

Table 7 presents the scored CKE 1's final fit to the examination blueprint. In all cases, the final number of scored items in a functional area fit within the established range.

The group endorsed the final set of items for use in scoring the June 2018 CKE 1 candidates who took this form.

Table 7: Final scored examination fit to blueprint

Functional Area	Actual	Min.	Target	Max.	Blueprint Range
10 Strategy	6	5	6	7	4% ± 1%
20 Professional Practice	15	14	16–17	19	11% ± 2%
30 Organizational Effectiveness	22	17	19–20	22	13% ± 2%
40 Workforce Planning & Talent Management	20	17	19–20	22	13% ± 2%
50 Labour & Employee Relations	17	14	16–17	19	11% ± 2%
60 Total Rewards	19	17	19–20	22	13% ± 2%
70 Learning & Development	20	17	19–20	22	13% ± 2%
80 Health, Wellness & Safe Workplace	14	14	16–17	19	11% ± 2%
90 HR Metrics, Reporting & Financial Management	17	14	16–17	19	11% ± 2%
<b>Total</b>	<b>150</b>				

## Establishing the Pass Mark: Equating

Equating, as per Kolen and Brennan (2014),<sup>5</sup> was used to establish the pass mark for the June 2018 CKE 1. The goal of this process was to set a pass mark for the June 2018 CKE 1 that would be equivalent to that set for previous CKE 1 administrations; that is, to set a pass mark that would give each candidate the same probability of passing regardless of which form they took.

The passing standard for the CKE 1 was originally set after the November 2015 offering of the CKE 1 using the Modified Angoff method. General details on that method can be found in Appendix B. Specific information on the standard-setting session is provided in the Technical Report issued for the November 2015 administration.

Two equating procedures were conducted back to different administrations (June 2017 and February 2018). The intention following these 2 equating runs was to average them to arrive at

<sup>5</sup> Kolen, M.J., & Brennan, R.L. (2014). *Test equating, scaling, and linking*. New York, NY: Springer.

a final pass mark for the June 2018 CKE 1. These administrations were chosen because they were the most recent administration and the administration corresponding roughly to the same administration month the previous year.

### Equating Back to the February 2018 Administration

Linear equating was the chosen method for setting the pass mark. Linear equating is preferred with more than 100 candidates, and equipercentile equating is preferred with more than 1,000 candidates. With candidate samples of fewer than 100, mean or circle arc equating is most prudent.

All candidates in the analysis (i.e., no repeat candidates or outliers) were used in the equating process. Delta plot analysis was used to identify anchor items showing substantial deviations (generally, although not exclusively, greater than 3 SD units) from expected difficulty values, with an emphasis on establishing an anchor set with difficulty equivalent to that of the full form that adhered to the blueprint. Further, items with very high or low difficulty values and those with low corrected point-biserials were also flagged for potential removal from the anchor set. The goal was a strong midi-test (i.e., moderate range of difficulty, moderate to high discrimination, fit to blueprint) of sufficient length to estimate candidate ability.

The selected set of anchor items had a mean difficulty of 0.68 and a mean corrected point-biserial of .25 (for June 2018 candidates).

Table 8 shows the fit of the set of anchor items to the blueprint, as percentages. The actual counts are reasonably aligned with targets and reflect the scope and approximate weighting across the full exam.

Table 8: Anchor item fit to blueprint – To February 2018

Area	Actual	Target
10	4%	4%
20	11%	11%
30	11%	13%
40	13%	13%
50	11%	11%
60	11%	13%
70	13%	13%
80	13%	11%
90	13%	11%

The mean, Tucker, Levine observed-score, circle arc, and Braun-Holland methods were computed to ascertain concordance of solutions. Given the sample sizes and similarities of test parameters, Tucker was considered the optimal method.

Table 9 shows some of the parameters used to derive the equating estimates, along with other parameters describing the test forms. Of note is that on the anchor items, the population taking the June 2018 CKE 1 scored lower than the population taking the February 2018 CKE 1 (68.0% vs. 70.9%, respectively;  $t(270)=1.66$ , *ns*). Though not statistically significant, the difference is still substantial. Because the June 2018 CKE 1 candidates showed lower ability (based on the anchors), they would likely have a lower pass rate than seen in February.

The equating analysis bears this out (Table 10). All methods indicate the same integer pass mark of 97. The Tucker value of 96.39 was extracted from this analysis for use in setting the final pass mark.

Table 9: Equating parameter table – To February 2018

		Feb. 2018	June 2018
	n	115	157
	Scored items	150	150
Mean score	Total	70.9%	68.0%
	Anchors	70.9%	68.0%

Table 10: Equating outcome table – To February 2018

Method	Pass Mark		Pass Rate	
	Precise	Integer	All	First-time
<b>Combo February 2018</b>	<b>97.71</b>	<b>98</b>	<b>64.2%</b>	<b>70.4%</b>
Tucker	96.39	97	58.6%	66.2%
Levine observed	96.69	97	58.6%	66.2%
Mean	96.66	97	58.6%	66.2%
Circle arc 1	96.93	97	58.6%	66.2%
Circle arc 2	96.93	97	58.6%	66.2%
Braun-Holland	96.49	97	58.6%	66.2%

## Equating Back to the June 2017 Administration

Linear equating was the chosen method for setting the pass mark, given the sample sizes involved.

All candidates in the analysis (i.e., no repeat candidates or outliers) were used in the equating process. Delta plot analysis was used to identify anchor items showing substantial deviations (generally, although not exclusively, greater than 3 SD units) from expected difficulty values, with an emphasis on establishing an anchor set with difficulty equivalent to that of the full form that adhered to the blueprint. Further, items with very high or low difficulty values and those with low corrected point-biserials were also flagged for potential removal from the anchor set. The goal was a strong midi-test (i.e., moderate range of difficulty, moderate to high discrimination, fit to blueprint) of sufficient length to estimate candidate ability.

The selected set of anchor items had a mean difficulty of 0.68 and a mean corrected point-biserial of .27 (for June 2018 candidates).

Table 11 shows the fit of the set of anchor items to the blueprint, as percentages. The actual counts are aligned with targets and reflect the scope and approximate weighting across the full exam.

Table 11: Anchor item fit to blueprint – To June 2017

Area	Actual	Target
10	4%	4%
20	11%	11%
30	13%	13%
40	13%	13%
50	11%	11%
60	13%	13%
70	13%	13%
80	11%	11%
90	11%	11%

The mean, Tucker, Levine observed-score, circle arc, and Braun-Holland methods were computed to ascertain concordance of solutions. Given the sample sizes and similarities of test parameters, Tucker was considered the optimal method. Notwithstanding this, a strong case could also be made for the Levine observed-score method because of the substantial difference in anchor performance. However, based on anchor variance ratio and an estimate of equating error, Tucker was preferred.



Table 12 shows some of the parameters used to derive the equating estimates, along with other parameters describing the test forms. Of note is that on the anchor items, the population taking the June 2018 CKE 1 scored significantly lower than the population taking the June 2017 CKE 1 (68.0% vs. 71.8%, respectively;  $t(302)=0.75$ ,  $p<.05$ ). Because the June 2018 candidates were of lesser ability (based on the anchors), that exam is expected to have a lower pass rate than the June 2017 exam.

The equating analysis bears this out (Table 13). The various methods indicate an integer pass mark of 97 or 98. The Tucker value of 96.852 was extracted from this analysis for use in setting the final pass mark.

Table 12: Equating parameter table – To June 2017

		June 2017	June 2018
n		147	157
Scored items		150	150
Mean score	Total	69.2%	68.0%
	Anchors	71.8%	68.1%

Table 13: Equating outcome table – to June 2017

Method	Pass Mark		Pass Rate	
	Precise	Integer	All	First-time
Combo June 2017	94.50	95	67.8%	75.5%
Tucker	96.85	97	58.6%	66.2%
Levine observed	97.68	98	56.7%	65.6%
Mean	96.81	97	58.6%	66.2%
Circle arc 1	97.23	98	56.7%	65.6%
Circle arc 2	97.20	98	56.7%	65.6%
Braun-Holland	96.51	98	56.7%	65.6%

### Combined Results

Table 14 shows the pass mark values across the 2 equating runs. The value highlighted in green is the one that would be selected based on sample parameters at each equating run. Barring a sound reason to choose otherwise, the simple arithmetical mean (96.622406) of the 2 identified values was the recommended pass mark for the June 2018 CKE 1.

Using the established convention for this testing program, the mean combined value was rounded up to a cut score of 97. The resulting pass rate of 66.2% for first-time candidates is about 4 percentage points lower than that seen in February 2018 and about 10 percentage points lower than that seen in June 2017; these drops were anticipated based on the lower performance on the common anchor items. The pass rate for all candidates in June 2018 was 58.6%. See Table 15 for historical pass rates.

The final pass mark value, and the process used to derive it, was presented to the CHRP EVC (Table 16) via teleconference on June 29, 2018. No concerns were raised regarding the pass mark or pass rate. The panel asked if there was a point at which there were too few candidates to run these analyses; they were assured that for the analyses there are sufficient candidates, but that caution must always be exercised. The panel formally approved the pass mark (which was presented along with the consequent pass rate data) for recommendation to HRP. HRP subsequently accepted the panel's recommendation and the pass mark was formally established.

Table 14: Equating outcome table – Combined results

	June 17	Feb. 18
Tucker	96.9	96.4
Levine observed	97.7	96.7
Mean	96.8	96.7
Circle arc 1	97.2	96.9
Circle arc 2	97.2	96.9
Braun-Holland	96.5	96.5

Table 15: Historical pass rates

	Pass rate	
	All	First-time
June 16	65.4%	69.1%
Nov. 16	58.8%	62.1%
Feb. 17	50.5%	62.5%
June 17	67.8%	75.5%
Oct. 17	59.2%	66.5%
Feb. 18	64.2%	70.4%
June 18	58.6%	66.2%

Table 16: CHRP Examination Validation Committee members – Pass mark approval

Member	Credential	Years of Relevant Experience	Years on EVC	Industry
✓ Sunday Ajao	CHRL	15–20	1	Banking/finance
Claire Chester	CHRL	10–14	1	Regulation/CPA
Tanya Gopaul	CHRL	10–15	1	Banking
✓ Jean Lazarus	CHRL	15–19	1	Health services
Kriss Stone	CHRP	10–15	1	Real estate
✓ Ielean Tait	CHRL	15–20	1	Environmental
✓ Karen Weiler	CHRL	20–29	1	Software/ communications
✓ Alyssa Young	CHRL	5–9	1	Non-profit

✓ Participated in the session.

## Scoring

To finalize the scoring, candidates who were not included in the item and form analysis were reinserted into the dataset. Scores for each of the 9 functional areas were also computed for each candidate. An Excel file with the final candidate results was provided to HRP.

Table 17 provides the means and standard deviations for the functional areas and for the total score, using all candidates who took the new June 2018 CKE 1 form. Table 18 provides the correlations between each functional area. Caution should be exercised in interpreting differences between correlations. Variation can be explained largely by the number of items making up each functional area score. That is, functional areas with fewer items on the exam have lower correlations with the other functional areas. Figure 3 shows the distribution of scores for all candidates, along with the pass mark.

Table 17: Total and functional area scores for all candidates

	Functional Area	Percentage	Mean	SD*
10	Strategy	74%	4.4	1.2
20	Professional Practice	68%	10.2	2.3
30	Organizational Effectiveness	70%	15.3	3.3
40	Workforce Planning & Talent Management	64%	12.7	2.9
50	Labour & Employee Relations	69%	11.7	2.6
60	Total Rewards	57%	10.9	3.0
70	Learning & Development	69%	13.7	2.8
80	Health, Wellness & Safe Workplace	67%	9.4	2.2
90	HR Metrics, Reporting & Financial Management	64%	11.0	2.4
<b>Total score</b>		66.2%	99.4	16.8

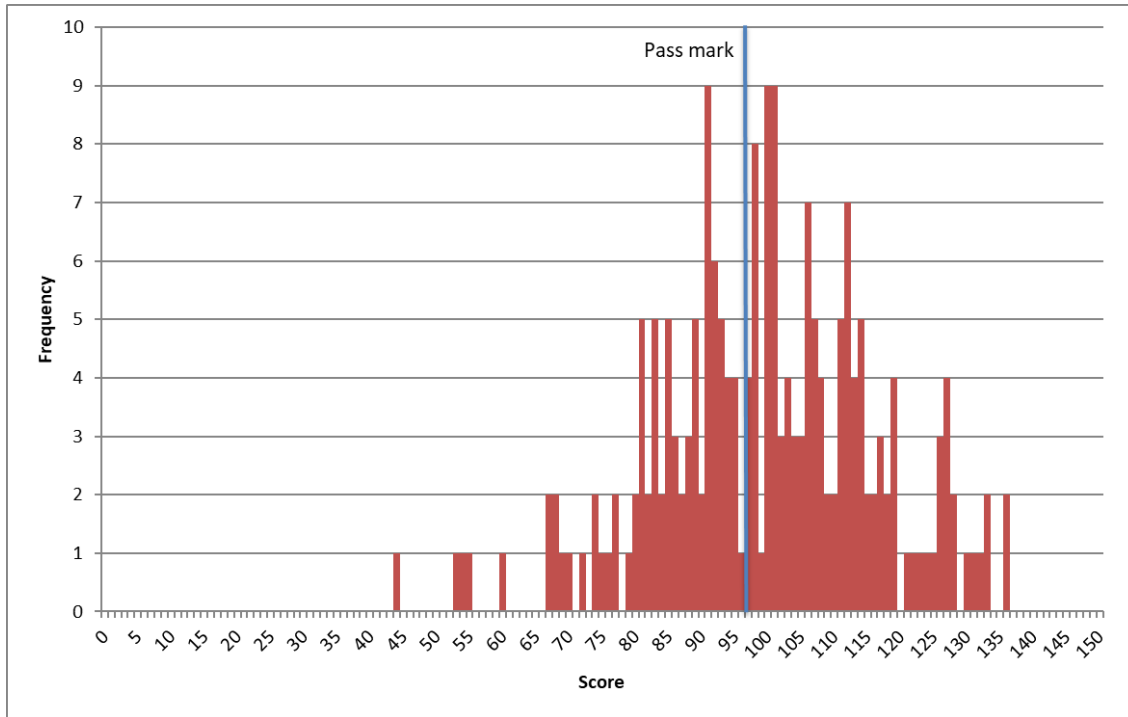
\*SD = Standard deviation.

Table 18: Correlations between functional area scores for all candidates

Area*	10	20	30	40	50	60	70	80	90
10		.31	.38	.40	.33	.34	.34	.27	.33
20			.49	.51	.47	.58	.46	.33	.37
30				.59	.52	.56	.56	.46	.46
40					.62	.64	.58	.46	.44
50						.58	.54	.51	.49
60							.52	.42	.42
70								.45	.46
80									.30
90									

\*See Table 17 for the full name of each functional area.

Figure 3: Score distribution for all candidates



## Key Examination Metrics

Table 19 shows the key examination metrics for candidates included in the main analysis; that is, only first-time candidates, with outliers removed. Past metrics are provided for reference.

Table 19: Key examination metrics – Candidates included in analysis only

Index	June 2018	February 2018	October 2017	June 2017	February 2017
Scored items	150	150	150	150	150
Candidates	157	115	182	147	48
Mean	102.0 (68.0%)	106.3 (70.9%)	104.3 (69.5%)	103.8 (69.2%)	100.5 (67.0%)
Median	103 (68.7%)	109 (72.7%)	106 (70.7%)	104 (69.3%)	101 (67.3%)
Skewness	-0.403	-0.483	-0.489	-0.230	-0.335
Kurtosis <sup>i</sup>	0.208	-0.525	0.024	-0.578	-0.054
Range	53–136 (35.3– 90.7%)	61–136 (40.7– 90.7%)	57–134 (38.0– 89.3%)	66–136 (44.0– 90.7%)	56–131 (37.3– 87.3%)
Standard deviation	16.68	17.60	15.81	15.96	15.93
Cronbach's alpha	.90	.92	.90	.89	.89
Mean $r_{pb}$ *	.23	.25	.22	.22	.22
SEM <sup>ii</sup>	5.24	5.13	5.11	5.19	5.24
SEM at the pass mark	5.53	5.56	5.43	5.58	5.51
Decision consistency (uncorrected) <sup>iii</sup>	.86	.92	.87	.86	.87
Perceived fairness <sup>iv</sup>	49%	43%	49%	36%	42%
Pass mark	96.622	97.710	98.387	94.496	95.236
Effective pass mark	97	98	99	95	96
Pass rate	66.2%	70.4%	66.5%	75.5%	62.5%

<sup>i</sup>Excess

<sup>ii</sup>SEM = standard error of measurement.

<sup>iii</sup>Subkoviak method.

<sup>iv</sup>Based on responses to the post-examination survey.

## Related Development Activities

Since the last administration of the CKE 1 in February 2018, the following exam development activities have taken place.

### Item Validation

To provide sufficient items for the upcoming administrations, a validation session was held April 9–11, 2018, at HRPAs offices. The CHRP EVC members who participated are listed in Table 20. This session involved the review of CHRP ELE items as well.

Table 20: CHRP Examination Validation Committee – Item validation

Member	Credential	Years of Relevant Experience	Years on EVC	Industry
✓ Sunday Ajao	CHRL	15–20	1	Banking/finance
✓ Claire Chester	CHRL	10–14	1	Regulation/CPA
✓ Tanya Gopaul	CHRL	10–15	1	Banking
✓ Jean Lazarus	CHRL	15–19	1	Health services
Kriss Stone	CHRP	10–15	1	Real estate
Ielean Tait	CHRL	15–20	1	Environmental
Karen Weiler	CHRL	20–29	1	Software/ communications
✓ Alyssa Young	CHRL	5–9	1	Non-profit

✓ Participated in the session.

The EVC members received advance materials outlining the following:

- Purpose of the session
- Description of the CHRP credential
- CKE 1 and CHRP ELE blueprints
- Criteria for good test items
- Validation process
- Relevant legislation

At the session, abbreviated training was provided as these committee members were already informed about the credentials and general process from previous sessions. This training included a primer on psychometrics to orient the committee to the item statistics they would be working with.

For each item, the committee was asked to either

- Validate the item for use in the next 2 years to make decisions about who would be certified as an HR professional in Ontario (at the CHRP or CHRL level),
- Validate the item for the CKE 1 or the CKE 2 only,
- Revise the item to make it suitable for use, or
- Declare the item unsound and send it back for revision or removal from the bank.

The bulk of the session saw the committee members reviewing items independently and submitting their assessments in blocks of approximately 20–25 items. Those assessments were tabulated and any items that were not validated as is by the full committee were discussed until there was agreement on changes and the future use of the item.

The panel members reviewed and validated 191 items as suitable for the CKE 1, designated 1 item as suitable for the CKE 2, designated 0 items as suitable for one of the ELEs, and rejected 7 items. Very few items were edited as the items had gone through considerable review before getting to the committee for validation.

## CKE 1 Blueprint Revision

At the validation session held April 9–11, 2018 (see section above), the CHRP EVC was asked to consider minor revisions to the CKE 1 blueprint.

The following changes were approved:

1. Formalization of purpose statement for the CKE 1:  
“The CKE 1 assesses whether a candidate has the knowledge required to be an effective human resources professional at the CHRP level, in Ontario. Knowledge related exclusively to employment-related legislation will be assessed on the CHRP Employment Law Examination.”
2. Change in how item counts are reported from “150 items plus 25 experimental items” to “175 items, of which 20–30 are experimental.” This change allows more flexibility in form design.
3. Revision of weights in most functional areas to reflect that the CHRP ELE is the vehicle for assessing legislation-specific content. The CHRP EVC reviewed the competencies to identify those that were either entirely or partly related to employment law. Competencies entirely about employment law were not to be assessed on the CKE 1; those partly related to employment law were to be assessed at 50% the weight of other competencies. The removed competencies were added to the existing list of competencies not applicable to the CKE 1. That full listing appears in Table 21.



Table 21: Competencies not eligible for the CKE 1

FA	Comp	FA	Comp	FA	Comp	FA	Comp
10	C005	40	C084	70	C152	80	C177
	C007		C089		C155		C179
	C009	50	C113		C156		C187
	C011		C114		C158		C192
	C012		C117		C159	90	C194
	C017		C123		C163		C195
20	C035		C125		C165		C196
	C036	60	C139		C204		
	C037		C141		C205		
	C041		C143		C206		
30	C050		C146		C171	C210	
	C056	70	C172		90		
	C057		C173				
	C065		C175				

These changes were considered minor in nature, and the relative weighting by functional area (after removing employment-law-specific competencies) was not altered.

The changes were presented to the HRP A Registrar on April 11, 2018, and were approved as recommended by the CHRP EVC. The decision was taken that the changes would be implemented as of the June 2018 administration of the CKE 1.

# Appendix A

## Blueprint

### Comprehensive Knowledge Examination 1

Human Resources Professionals Association

Version 2.1

Approved by *CHRP Exam Validation Committee April 9, 2018*

Approved by *HRPA Registrar April 11, 2018*

Effective June 2018

### Credential

Passing the Comprehensive Knowledge Examination 1 is a requirement for certification for CHRP candidates. The examination reflects the *HRPA Professional HR Competency Framework (2014)*.

### Purpose

The CKE 1 assesses whether a candidate has the knowledge required to be an effective human resources professional at the CHRP level, in Ontario. Knowledge related exclusively to employment-related legislation will be assessed on the CHRP Employment Law Examination.

### Structure

The structural variables provide high-level guidance as to what the examination will be like.

Table 22: CKE 1 Blueprint structural variables

Item types	Independent 4-option multiple choice
Length	175 items in total
	20–30 experimental items
Duration	Up to 3½ hours
Delivery mode	Computer-based testing in proctored test centres
Frequency	3 windows per year

## Content Weighting

The functional area weights were set in 2014 to reflect an equal importance across the functional areas, except with a lower expectation for Strategy. The weights were modified slightly in 2018 to remove weighting for competencies most appropriately tested on the CHRP Employment Law Examination. Within each functional area, items are distributed roughly evenly across the related competencies.

Table 23: Functional area weights on the CKE 1

Functional Area		CKE 1	
		Weight	Range
10	Strategy	4%	+/- 1%
20	Professional Practice	11%	+/- 2%
30	Organizational Effectiveness	13%	+/- 2%
40	Workforce Planning & Talent Management	13%	+/- 2%
50	Labour & Employee Relations	11%	+/- 2%
60	Total Rewards	13%	+/- 2%
70	Learning & Development	13%	+/- 2%
80	Health, Wellness & Safe Workplace	11%	+/- 2%
90	Human Resources Metrics, Reporting & Financial Management	11%	+/- 2%

Table 24: Competencies not eligible on the CKE 1

FA	Comp	FA	Comp	FA	Comp	FA	Comp
10	C005	40	C084	70	C152	80	C177
	C007		C089		C155		C179
	C009	50	C113		C156		C187
	C011		C114		C158		C192
	C012		C117		C159	90	C194
	C017		C123		C163		C195
20	C035		C125		C165		C196
	C036	60	C139		C166		C204
	C037		C141		C171		C205
	C041		C143		C172		C206
30	C050		C146		C173	C210	
	C056		C175				
	C057						
	C065						

# Appendix B

## MODIFIED ANGOFF METHOD

**WHAT IT IS** → The Modified Angoff method of setting cut scores is the most popular method used with high-stakes examinations. With this method, experts evaluate each item on a test for difficulty and judge how likely it is that someone who is borderline in performance will get each item correct. Borderline candidates have, by definition, just enough competence to be considered competent (e.g., to pass the test). Any candidate showing the same or a higher level of performance as a borderline candidate is thus a “passing” candidate, and any candidate showing performance below the level of a borderline candidate is a “failing” candidate. The method has been successfully defended in court as being a fair method of setting cut scores that are used to make high-stakes decisions about candidates.

**HOW IT'S DONE** → The Modified Angoff method typically requires 5 to 15 experts in the field and is facilitated by a psychometrician. There are many variations of the Modified Angoff method used in practice, but generally the process begins with detailed training on how to apply ratings, followed by development of a description of the borderline candidate. Once training is complete (including a calibration exercise to make sure all raters have fully grasped the method), ratings are applied individually by each rater and compiled by the psychometrician. Discrepancies across raters are identified and flagged for discussion. Raters then have an opportunity to discuss their ratings and to rerate any items if the new information is considered cause to do so. In some cases, the psychometrician will introduce data from previous administrations of the item to further refine judgments. Once all items have been rated, an average Angoff rating for the exam is calculated by simply taking the average of all item ratings. The result is the cut score for the exam as a whole.

**WHY IT'S USED** → The benefit of the Modified Angoff method is that the resulting cut scores set an objective hurdle for candidates. Candidates who demonstrate performance above the borderline level (as systematically established by experts) are considered to have sufficient competence, and those below that level are considered to have insufficient competence. The proportion of candidates deemed below or above the cut score is not arbitrary and depends only on the actual ability of those candidates. For examinations resulting in pass/fail decisions, the implication of this is that all candidates would pass if they all showed better than the minimal accepted level of competence (i.e., above the borderline), or they would all fail if they all showed less than the minimal accepted level of competence. What is important is whether each candidate scores above or below the cut score, with that cut score being set based on the actual difficulty of the test and the expected performance of candidates showing the lowest level of acceptable performance. Because of this, the Modified Angoff method fairly assesses individual candidates on their own merits.

### References

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